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Medical Essays

AND

OBSERVATIONS,

Revised and Published by

A SOCIETY in *Edinburgh.*

VOLUME I.

EDINBURGH,

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TO

Sir HANS SLOANE, *Bart.*

PRESIDENT;

AND,

To the COUNCIL and FELLOWS of the ROYAL SOCIETY of *London,*

For Improving Natural Knowledge.

Moſt and Much Honoured,

THE glorious Example given to the World by the ROYAL SOCIETY, has made ſuch an advantageous Change in Natural Knowledge ſince the Mid-

dle of laſt Century, that the firſt Fruits of all Labours of this kind become in Juſtice due to the firſt and great Promoters of it.

The juſt Senſe of this determines us to offer to your Protection the following Sheets, deſigned to improve one Branch of that extenſive Science of Nature, which you cultivate, with ſo much Honour to your ſelves, and Advantage to Mankind. We are,

Gentlemen,

Your moſt obedient,

and moſt humble Servants

THE COLLECTORS

THE PREFACE.

NO Complaint is more general among thoſe who apply to the Study of any liberal Science, than their being under a Neceſſity of peruſing ſuch Numbers of Books as are wrote on the ſeveral Parts of each of them: A Labour that can have no End, ſince one Book ſerves only as an Introduction to another, while a few Pages might contain all that is new or valuable in moſt of them. It muſt however be confeſſed, that many good and uſeful Remarks and Diſcoveries are loſt, by the Unwillingneſs of ſome ingenious Men to appear in Print, and by others having neither Time nor Inclination to compoſe a ſizable Treatiſe, who would communicate neceſſary and beneficial Obſervations to the World, if they had a proper Opportunity to do it in a Sheet or two.

One probable Method of remedying these two Discouragements to Learning is, to publish Collections of small Treatises, submitted to the Examination of a Society of such who had particularly studied the Science which is the Subject of each Tract; and who should give some short Account of the most remarkable and useful Discoveries and Improvements made by the cotemporary Authors in their own Profession: By which we would soon have more Authors, and fewer Books, to the great Advancement of Learniug, and abridging of our Studies.

There is no Science in which there is more Reason to complain of the Abuses above mentioned than in Medicine, *as evidently appears on viewing the Catalogues of the* Scripta medica; *for tho' the Numbers and Sizes of Books are very great, how few of them are in Esteem? and of these much the smaller Share is wrote with a View to promote the principal Part of Medicine, the Knowledge and Cure of Diseases, which chiefly depend on Observations of Facts that ought to be frequently repeated before any certain Axiom in Physick can be built on them; and of which there is such a Variety as might afford an inexhaustible Subject of Observation, tho'*

there

there were no Changes made at any Time in the State of Phyſick: But from what we are certainly informed of in the Hiſtory of this Science, there ſeems to be a Neceſſity, not only to ſtudy and improve the Obſervations of thoſe who went before us, but for the Phyſicians of every Age to collect others for their own Uſe, and the Advantage of their Succeſſors; ſince very often they cannot be aſſiſted by any older Writer, becauſe ſeveral new Diſeaſes, unknown to our Anceſtors, diſcover themſelves; Names both of Diſeaſes and Drugs change, and are differently applied; Improvements and Diſcoveries are daily made; Medicines at one Time in the higheſt Reputation are ſoon laid aſide, and others are ſubſtituted in their Place; and the Form and Manner of uſing thoſe ſtill retained are perpetually diverſified.

Phyſicians muſt be very ſenſible of theſe Inconveniencies, in reading the Works of the firſt great Improvers of Medicine by Obſervation, the Greeks; *nor are they leſs evident in the* Arabians, *who ſucceeded and copied after the* Greeks: *As we deſcend nearer to our own Time, ſome of theſe Difficulties are indeed gradually removed, tho' it is to be regreted, that the Succeſſion of different Philoſophies pre-*

vailing in the Theory, has continued other Difficulties in the Practice of Medicine.

Beſides theſe general Arguments for Phyſicians continuing to make and communicate Obſervations, we of the Britiſh *Dominions have particular Reaſons, more than ſome of our Neighbours, to be employed this Way, ſeeing we have been favoured with very few medical Obſervations of our own; and on the other hand, our Climate, Way of living, and other Circumſtances, which ought to be greatly regarded in the Cure of Diſeaſes, are very different from moſt Inhabitants of the Continent; to which may be added, that every Nation has its own prevailing Mode of preſcribing. On theſe Accounts young Practiſers muſt be under the greateſt Difficulty to accommodate foreign Obſervations, which they muſt have Recourſe to, to the Conſtitutions of their Countrymen, and to the then faſhionable* Formulæ *of Medicines.*

Theſe Reaſons already mentioned, which are founded on the Nature of the Subject itſelf, ought certainly to incite us to obviate ſuch Difficulties; and the Neceſſity of eſtabliſhing Phyſick on a better Footing among us, will ſtill appear in a ſtronger Light, upon taking a View of the different

rent Manners in which Obſervations are handed down to us.

Thoſe who publiſh Volumes of their own Practice, Improvements and Diſcoveries, undertake a Task very difficult to be executed as it ought, becauſe of the Qualifications neceſſary for it, which chiefly are Sagacity *and* Knowledge, *to guard againſt Errors and Miſtakes in the Names and Nature of Things, and to diſtinguiſh between trite trifling Facts and ſuch as are neceſſary to be remarked:* Accuracy, *to omit no eſſential Circumſtance;* and Candour, *to conceal nothing material. Theſe are Qualities not ſo frequently to be found all conjoined in one Perſon; either Nature has not been bountiful enough, or Temptations are ſtrong. Vanity and Intereſt are powerful Motives to make us magnify our own Succeſs, conceal our Miſtakes, and to wiſh the World would believe us ignorant of no Diſeaſe or its Cure. Humane Nature is ſubject to ſuch Infirmities; and there have not been wanting Criticks, who have endeavoured to fix Failures in ſome one or other of theſe Articles on Numbers of our modern Obſervators: We wiſh we could juſtly exculpate them.*

If we ought therefore to be cautious in giving

giving an implicite Credit to original Authors, we muſt be no leſs on our Guard in conſulting the voluminous Compilers, who indifferently collect from all Books every Caſe relating to the Title of their Sections or Chapters.

Several Collections of Obſervations communicated to ſome conſiderable Men by their Correſpondents have been publiſhed, and ſeemed to promiſe more Accuracy and Candour, by paſſing thro' the Hands of a Cenſor equal to the Task; but even in theſe we find plain Marks of the Publiſher's too great Complaiſance, or of his Fear to offend. The only Collections of of this kind that we know to be continued of late, are the Acta Medica Berolinenſia, *and* Acta Wratiſlavienſia; *Both theſe at leaſt labour under the Diſadvantages common to all foreign Obſervators. The firſt ſeems to be wholly compoſed by the Publiſher, without Aſſiſtance, or very exact Memoirs from any Friends; and the ſecond is in a Language, (the* High-Dutch) *very little underſtood by the* Britiſh, *and contains many Papers foreign to the immediate Improvement of Phyſick. But allowing theſe Collections to be put on the beſt Plan, it might be preſumed that a Society, of which every Member has his par-*

particular Task assigned him, to be executed behind the Curtain, would be as free from a faulty Complaisance or Fear, and as capable of performing the Work to Advantage, as one Gentleman who is engaged in private Practice, and publickly known for the Author.

The last Method of communicating Observations to the Publick, has been in Collections made by Societies; the most conspicuous of which are the Royal Society *in* London, *the* Academie-Royale des Sciences *at* Paris, *the* Academia Scientiarum Imperialis *at* Petersburgh, *and the* Academia naturæ curiosorum *in* Germany; *all instituted by publick Authority, for the Advancement of natural Knowledge, under which the several Branches of Medicine are comprehended.*

The Philosophical Transactions, *and* Memoires de Mathematique *and* de Physique, *are valuable Treasures, that publick Libraries cannot be without, and all learned Men wish to possess, in the numerous Volums of which, many Parts of Medicine have been treated with the utmost Accuracy and Ingenuity; but the Constitution of the* English Society *and* French Academy *does not allow them to insert several things which a Plan calculated only for the Improve-*

provement of Phyſick would eaſily admit; and it is to be regreted that their Papers are not ſo univerſally purchaſed as they ought, by thoſe who are imployed in Medicine, becauſe the greater Share of the Tracts are not immediately relative to their proper Buſineſs, but treat of Natural Hiſtory, Mechanicks, Aſtronomy, abſtract Mathematicks, &c.

The Petersburg Tranſactions *are yet of ſhort ſtanding, two Volumes being only publiſhed, and are ſo much on the ſame Plan with the former two, that we need not mention any further Reaſons why, in our Opinion, a Plan might be contrived that would be more generally peruſed by the Students and Practitioners of the different Branches of Phyſick.*

The Collections of the Academia naturæ curioſorum *appear to be more calculated for the immediate Improvement of Medicine than any of the former; but beſides containing many Papers of natural Hiſtory and Philoſophy, and being liable to the Inconveniencies of other foreign Obſervations, they omit ſeveral neceſſary Articles, which, in our Opinion, ought to be taken in.*

The Remarks we have made on the different Manners in which Obſervations have

have been communicated, are by no Means designed so much as to insinuate the Uselessness of consulting such Authors: On the contrary none can be more sensible than we are of the Advantages may be reaped from them, by those who have Knowledge enough to make a right Use of them. All we would be understood to infer is, that the Charges of some, and the Mixture of other Sciences with the medical Papers prevent their being so generally sought after; others are not calculated for our Climate and Practice; and some are to be read with Caution: From all which we would conclude, that a Collection of Observations wholly relative to Medicine, made in our own Country, and candidly and accurately related, would be the most effectual Way to improve Physick among us.

Tho' we have hitherto principally insisted on the Necessity of Observation, as in our Opinion the most essential Part of Physick, we are not unmindful how much is still wanting to complete the Theory *of Medicine, which we think would also be soonest and best done by small Essays, where an Author having but a little Field to cultivate, would certainly treat his Subject with much more Exactness, than when he*

he lies under the Neceſſity of writing up to the Size of a Book; where either for the Sake of two or three Pages, he muſt repeat what has been ſaid hundreds of Times before him, or muſt undertake to diſcuſs more Subjects than either his Genius, Reading, Study or Inclination would otherwiſe induce him to attempt.

The Deſire we have to remove the Diſadvantages which, in our Opinion, Medicine lies under on all theſe Accounts, is the only Motive that prevailed with us to undertake a yearly Collection of Medical Eſſays and Obſervations, of which we now publiſh the firſt Volume on the Plan mentioned in our Propoſals, which we ſhall here preſent the Reader with, that he may at one View be let into the whole Deſign; and we earneſtly beg to be acquainted by the learned Gentlemen in Phyſick, of what they think ſuperfluous or deficient in our Scheme, that this Work may be made as generally uſeful, as we moſt ſolemnly do declare we intend it.

It is propoſed that each Volume of MEDICAL OBSERVATIONS, *and* ESSAYS, *collected, reviſed and publiſhed by a Society at* Edinburgh, *ſhould contain,*

I. A Regiſter of the Height of the Barometer, Degrees of the Thermometer and Hygroſcope, the Quantity of Rain that falls, the Direction and Force of the Winds, and State of the Weather at *Edinburgh* for Twelve Months; compared with Obſervations of the ſame kind, communicated by Correſpondents.

II. An Account of the Diſeaſes which have been epidemick, or moſt univerſal in *Edinburgh*, in the ſeveral Seaſons of the preceeding Year, with an Extract from the Records of Burials; which ſhall alſo be compared with any Accounts of the ſame Nature ſent from other Places.

III. Obſervations and Eſſays on the following Subjects, 1. Hiſtory of any Part of Phyſick. 2. Simple Drugs. 3. Compound Galenical Medicines. 4. Chemical Operations and Experiments. 5. Anatomy. 6. Animal Oeconomy. 7. Theory. And 8. Practice of Surgery and Phyſick.

IV. Figures neceſſary to explain Inſtruments, Operations, Deſcriptions, *&c.* in any of the foregoing Tracts.

V. Diſ-

V. Diſcoveries or Improvements made any where elſe in the ſeveral Branches of Medicine.

VI. An alphabetical Index of the Contents.

That the Deſign and Uſefulneſs of this Work may be more fully underſtood, we ſhall firſt conſider the Share of it which we undertake, and then ſhall give our Opinion of the other Parts with which we expect to be furniſhed by the learned Gentlemen who ſhall pleaſe to favour us with their Correſpondence.

1. *The* Regiſter of the Barometer, *&c. will, we hope, not only be acceptable to all Lovers of natural Knowledge, but is abſolutely neceſſary to be compared with the epidemical Conſtitution, in order to determine a Fact, concerning which two of the greateſt and beſt Obſervators in Phyſick,* Hippocrates *and* Sydenham *ſeem to differ.* Hippocrates (*a*) *appearing to aſſign the different manifeſt Conſtitutions of the Air as the Cauſes of epidemick Diſeaſes*

(*a*) Epidemic, Lib. 1. § 3. & ubique, De humor, p. 50. De natur. hominis. 227

eaſes, and Sydenham (*a*) *affirming ſuch Diſeaſes to depend on ſome undiſcovered Quality of the Air, and not upon any of the ſenſible Changes in it.*

2. *Whatever Relation may be found between the Changes in our Atmoſphere and the epidemick Diſeaſes, all ſeem to agree, that there are certain Circumſtances and Symptoms which diſtinguiſh the Return of ſimilar Conſtitutions, and point out the moſt probable Method of Succeſs in treating Diſeaſes while ſuch Conſtitutions prevail. The only Way of diſcovering certainly theſe Circumſtances and Symptoms, is a long continued Series of Obſervations, which we hope our Work will ſupply.*

3. *We are to reviſe all the particular Obſervations and Eſſays tranſmitted to us, and to reduce them to the moſt convenient Order, publiſhing each in the Author's own Words; only we beg to be excuſed if we delay to inſert any Paper which appears to us deficient in Facts, or not ſo methodical, till theſe Circumſtances of which we ſhall inform the Author, are cleared up. We do not however pretend by this Power to reject Obſervations, tho' ſome Circumſtances are omitted, if they*

 are

(*a*) De morb. acut. § 1. cap. 2. cui titul. de morb. epidem. p. 4, & 5. Schedul. monit. p. 486.

are otherwise useful, nor to suppress Essays that are ingenious, tho' the Propositions they contain are contrary to our Way of thinking. All we propose by reserving this Choice of Papers, is to acquaint the Author of such Omissions or Objections as might be taken Notice of, that by supplying and correcting them, the Work may be made more acceptable to the Publick; and therefore we persuade our selves, that this Part of our Labour will prove one of the greatest Encouragements to procure us Correspondents.

4. *We shall oversee the engraving of necessary Figures, and shall return the Originals, if demanded, as soon as the graving is finished.*

5. *We shall give a short Account of the Improvements and Discoveries made any where else, that are of general Use; to which shall be annexed a List of the medical Books published during the Currency of our Year, with such as are proposed or promised to be soon printed; and any other Piece of literary News that shall seem to conduce to the Advancement of Physick.*

6. *We shall take Care to make the Index full and complete.*

The Manner in which each Subject expected from our Correspondents should be treat-

treated, is, in our Judgment;

1. *In hiſtorical Eſſays, the proper Vouchers are to be particularly quoted.*

2. *The Deſcriptions and Virtues of ſimple Drugs, are to be clearly and ſuccinctly told, without enlarging on Arguments* à priori, *which are too liable to lead into Error.*

3. *The Proportions and Method of preparing compound Medicines are to be narrated, without concealing any Ingredient, or the Manner of uſing them.*

4. *Chemical Experiments and Preparations are to be fully deſcribed, as to Ingredients, Veſſels, Furnaces, Degree of Heat, Time of Operation,* &c.

5. *Anatomical Diſcoveries are to be accurately deſcribed, and the eaſieſt Method of ſearching out the diſcovered Parts is to be related.*

6. *In all Queſtions and Diſputes relating to the Animal Oeconomy, Theory and Practice of Medicine, we deſire all perſonal Reflections, and offenſive Terms may be ſhunned.*

7. *The Hiſtories of morbid Caſes, whether in Phyſick or Surgery, are to be related without any theorical Reaſoning on the Nature of the Diſeaſe,* &c. *unleſs ſome particular Circumſtances require to be il-*

luſtrated; which may be done by a ſhort Note at the Foot of the Page. It is therefore expected that ſuch Hiſtories will only be a clear and ſuccinct Narrative of Facts, in which the Patient's Age, Sex, Conſtitution, former Way of Life, Diſeaſes to which they have been ſubject, or any other Circumſtances which ſerve to explain the preſent Caſe, are to be remarked. If any manifeſt Cauſe of a Diſeaſe has been known, it is to be mentioned. All the Symptoms, with the State of the Pulſe, Appetite, Thirſt, Sweat, Urine, Fæces, &c. are to be ſet down; and the Sequel is to be an exact Account of the Symptoms, Medicines preſcribed, their evident Effects, and of the Event, whether into Health, ſome other Diſeaſe, or Death. If the Patient died, and a Diſſection was allowed, the Parts preternaturally affected in their Situation, Texture, &c. are to be deſcribed.

Unſucceſsful Caſes, or even Miſtakes in the Nature of the Diſeaſe, or in the Practice, when known, do very often more Service to Practiſers in Medicine, than ſeveral ſucceſsful Caſes, ſince they are ſo many Warnings from falling into the ſame Miſtake: We therefore beg our Correſpondents to acquaint us of ſuch, if they

ſhould

ſhould happen, declaring we will not publiſh ſuch Accounts, unleſs they are ſent by the Phyſician or Surgeon immediately concerned; and that we will, if deſired, ſuppreſs the Name of the Gentleman who has Candour and Honeſty enough to acknowledge his Miſtake, and to make the World wiſer in an uncommon Way.

8. *There is no more deſired than an open full Detail of the Improvements in either Phyſick or Surgery.*

9. *Where two or more Phyſicians or Surgeons are employed in treating the ſame Patient, or in making the ſame Experiment, it is to be wiſhed they would write the Caſe, or Account of the Experiment conjunctly, or at leaſt that he who relates it, would do it with all Fairneſs and Ingenuity, without diſcovering Partiality for his own Opinion, or diſputing againſt the Sentiments of others.*

10. *Seeing we propoſe, when there is Occaſion, to ſend our Correſpondents Remarks on their Papers, it will be neceſſary that each Gentleman ſhould write his Name, Deſignation and full Addreſs in the Papers he deſigns to tranſmit to us.*

11. *The Language wherein it will be moſt acceptable to us to have the Obſervations and Eſſays wrote, is* Engliſh, *in which*

the whole Work is designed to be published, not without some Regrete on our Part; because we, and probably some of our Correspondents, might have been more certain not to transgress at least in Latin Rules of Grammar: But several obvious enough and more forcible Reasons dissuaded us from this Language; and tho' we may not write pure English, *which cannot be expected from our Country, yet we would willingly hope we may be able to express ourselves intelligibly, which is the principal thing in a Work of this Kind, where Elegance of Stile cannot be expected, and Wit would be hurtful. If the learned World shall ever think our Collections deserve to be more generally understood, we are willing to contribute all in our Power to their appearing in a more universal Language.*

Besides what is proposed by the general Scheme, we have inserted into this first Volume a Description of Edinburgh, *and of the Instruments wherewith the Meteorological Observations were made. The first is done only with a medical View, that is, we have remarked the Situation and other Particulars of* Edinburgh, *which we think can influence the State of the Air, or occasion Diseases, and the Mechanism, Situation, &c. of each Instrument, are necessary*

ceſſary to be known, that the Obſervations may be compared with others. We beg all our Correſpondents to premiſe ſuch Deſcriptions alſo to their Accounts of the the State of the Air, and epidemic Diſeaſes, without which Compariſons cannot be made.

We have alſo publiſhed here the full Regiſter of daily Obſervations made with the Barometer, &c. *that we might ſhow the Method uſed by us, and deſire the Opinion of the curious Learned, whether we ought in the ſucceeding Volums to continue this Regiſter in the ſame Form, or if we ought to abridge it as it is done by the* French Academy.

We chuſe to begin our Regiſter, &c. *of our medical Year with the Month of* June, *becauſe then the vernal Diſeaſes are wore out, and a new Conſtitution is not begun; whereas if we had followed the Example of moſt other Societies, by beginning with* January, *we muſt have broke in upon the middle of the moſt violent epidemick Diſeaſes that happen in this Place.*

We cannot conclude, without returning Thanks to the Gentlemen who have furniſhed the Materials for this firſt Volume, and muſt preſume that their Example, and this convincing Proof of our being

in good earneſt to execute our Propoſals, will ſoon encreaſe our Correſpondence. We are perſwaded our Work will be acceptable to the Publick, if the Papers tranſmitted to us hereafter, are as uſeful and ingenious as thoſe we now publiſh.

We muſt likewiſe ask Pardon of ſome Gentlemen whoſe Papers we have been obliged to reſerve till next Volume is publiſhed, leſt we ſhould have made this too bulky. Our only Rule in the Choice of Papers at preſent, has been to withdraw thoſe that were ſent us by Correſpondents, from whom we had received others that are here publiſhed; which we thought the ſureſt Way of ſhowing as equal a Regard for all, as the Plan to which we had reſolved to reſtrict our ſelves would allow.

CON-

CONTENTS.

Art. Pag.

I. THE *Description of* Edinburgh, 1

II. *A Description of the Instruments with which the Observations in the meteorological Register were made,* 7

III. *The meteorological Register,* 12

IV. *An Account of the Diseases that were most frequent last Year in* Edinburgh, 37

V. *An Extract from the publick Register of Burials in* Edinburgh, 45

VI. *An alterative mercurial Medicine, by* Andrew Plummer, M. D. *Fellow of the College of Physicians, and Professor of Medicine in the University of* Edinburgh, 46

VII. *An Account of the Virtues and Use of the mineral Waters near* Moffat, *by Mr.* George Millegen *Surgeon at* Moffat, 62

VIII. *Experiments on the medicinal Waters of* Moffat, *by* Andrew Plummer, M. D. 82

IX. *An Essay on the Art of injecting the Vessels of Animals, by* Alexander Monro, *Professor of Anatomy in the University of* Edinburgh, *and* F. R. S. 94

X. *A Demonstration of the Strength of Bones to resist Powers applied to break them transversely, by Dr.* William Porterfield, *Fellow*

Art. Pag.
of the Royal College of Physicians in Edinburgh, 112
XI. *Remarks on the Articulation, Muscles and Luxation of the lower Jaw; by* Alexander Monro, *P. A.* 124
XII. *An Essay on the alternate Motions of the* Thorax *and Lungs in Respiration, by Dr.* George Martine, *Physician at St.* Andrew's, 156
XIII. *An Essay on the Nutrition of the* Fœtus in utero, *by Mr.* Joseph Gibson, *Surgeon at* Leith, *Member of the Society of Chirurgeon-Apothecaries in* Edinburgh, *and City Professor of Midwifery,* 171
XIV. *Two Examples of Children born with preternatural Conformations of the Guts, by Mr.* James Calder junior, *Surgeon in* Glasgow, 203
XV. *A Wound of the Neck with uncommon Symptoms, by Mr.* John Kennedy, *Chirurgeon-Apothecary in* Edinburgh, 206
XVI. *An Account of a large Bone extracted from the lower Part of the Gullet, by Mr.* John Stedman *Surgeon at* Kinross, 210
XVII. *An uncommon Tumor of the Breast, by Dr.* Peter Paton, *Physician at* Glasgow, 213
XVIII. *Improvements in performing the Operation of the* Paracenthesis, *or tapping of the Belly, by* Alexander Monro, *P. A.* 214
XIX. *Worms evacuated at an Ulcer of the Groin: By Mr.* James Douglas, *Surgeon to General* Sabine's *Regiment,* 222
XX. *A Mortification of the Guts in a Hernia cured,*

Art. Pag.
cured, by Mr. James Jamieſon, *Surgeon in* Kelſo, 227
XXI. *Stones in the Kidney, with Remarks on the Operation of Nephrotomy, by Mr.* John Douglas, *Surgeon in* Edinburgh, 231
XXII. *An anomalous Tumor of the Leg unſucceſsfully treated, by* ——, 234
XXIII. *The larger Share of the* Tibia *taken out, and afterwards ſupplied by a* Callus, *by Mr.* David Laing, *Surgeon in* Jedburgh, 238
XXIV. *An Eſſay on Mr.* Garengeot's *good Manners and univerſal Learning, inſcribed to the Memory of Dr.* Friend, *by* ——, *Prentice to a Surgeon-Apothecary in* Edinburgh, 242
XXV. *An Eſſay on the Improvement of Medicine, by Dr.* John Drummond ſenior, *late Preſident of the Royal College of Phyſicians in* Edinburgh, 258
XXVI. *An Ulcer in the Lungs piercing thro' the Diaphragm into the Liver, by Dr.* Edward Barry, *Phyſician at* Cork *in* Ireland, 273
XXVII. *A Tumor in the* Oeſophagus *from a ſingular Cauſe, by Dr.* Gilbert Waugh, *Phyſician at* Kirkleathem *in* Yorkſhire, 274
XXVIII. *Spaſms in the* Oeſophagus, *by Mr.* James Aird, *Chirurgeon-Apothecary in* Cumnock, 277
XXIX. *An Inflammation of the Stomach, with* Hydrophobia *and other uncommon Symptoms, by Dr.* John Innes, *Fellow of the College of Phyſicians, and Profeſſor of Medicine in the Univerſity of* Edinburgh, 283

XXX.

Art. Pag.
XXX. *Loss of Appetite, and an Atrophy from the Stomach displaced, by Dr.* Robert Lowis, *Fellow of the College of Physicians at* Edinburgh, 290
XXXI. *A Tympany, by* Alexander Monro, *P. A.* 294
XXXII. *Colicks for six Years from a Concretion formed on a Plum-stone lodged in the Guts, by Dr.* Thomas Simson, *Professor of Medicine in the University of St.* Andrews, 301
XXXIII. *An Essay on the Jaundice, by* ——, 305
XXXIV. *The Bladder become schirrous from a singular Cause, by Dr.* Edward Barry, *Physician at* Cork, 321
XXXV. *A Retention of Seed in Coition, by* William Cockburn M. D. *and Fellow of the Royal Society,* 326
XXXVI. *A Palsy of the inferior Extremities with Mortification, by Dr.* John Drummond senior, *late President of the College of Physicians in* Edinburgh, 327
XXXVII. *An Account of the most remarkable Discoveries and Improvements in Physick made or proposed since the Beginning of the Year* 1731, 334
XXXVIII. *A List of medical Books published since the Beginning of* 1731, 349
XXXIX. *Books promised, and proposed to be soon published,* 358
XL. *Societies lately formed for the Improvement of Physick,* 361

Medical

Medical Essays

AND

OBSERVATIONS.

ARTICLE I.

The Description of EDINBURGH.

THE City of EDINBURGH is placed in 3 Degrees of Longitude West from *London*, and in 55° 55′ of Northern Latitude, is about a Mile long, and, in several Parts, near half as broad. It stands chiefly on the Ridge of a Hill, which at its lowest Part, the Palace of *Holy-rood-house*, is 94 Feet higher than the Level of the Sea, and gradually

dually ascends from thence, in a Direction betwixt the Points W. b. S. and W. S. W. to its highest Part the *Castle-hill*; the perpendicular Height of this Ascent being 180 Feet. All this Ridge of a Hill is one large fine Street, which is divided near the Middle by cross Building, and a Gate, (the *Nether-bow*.) The upper Division is properly the City, and commonly is called the *High-Town*, and the lower Half is named the *Canongate*.

The Lanes (*Closses*) going off from the High-street, are narrow and steep, especially those of the North-side, on which Side the Houses are not continued down to the Foot of the Hill, but on the Brow there are Gardens between the Buildings, and the fresh Water Lake (the *Nore-loch*.) On the Side of this Loch, nearest the Town, the Butchers have their Slaughter-houses, and the Tanners and Skinners their Pits. Several Lanes (the *Wynds*) on the South-side of the Street are larger, and not so steep as the others above mentioned, are built on both Sides, and terminate in a narrow Street (the *Cowgate*) that runs parallel every where with the High-Street. There is a Tradition that this low Part of the Town was formerly a Loch, in regard of which the one now remaining on the opposite

posite Side of the City was called *Noreloch*; and there are now plenty of Springs every where in the *Cowgate*; and after violent Rains, the Water makes its Way in great Quantities, thro' the Floors of the Ground-Stories there. From the *Cowgate* other Lanes are continued Southwards to the City-Wall, which is built on another Ridge, almoſt parallel to the High-ſtreet: Where theſe Lanes are not, there are Gardens, Burying-places, *&c.* within the Wall, and beyond it from the Gates, are ſome large Suburbs.

Between the low Street of *Cowgate*, and this South-wall, moſt of the Brewars have their Work-houſes, for the Convenience of Water.

The *Canongate* or lower Part of the Town, the larger Share of which is properly without the Liberties of the City, has narrow Lanes going off from each Side of the Street; but the Houſes not being built far down, there is conſiderable Space for Gardens, that are all planted and laboured.

The Houſes in *Edinburgh* are of Stone, and are allowed by Law to be five Storeys high to the Street, but are generally higher backwards. They are built very cloſe on each other; and one Stair often ſerves two Houſes, each of which contains a Family

in every Storey; the Height of the Houſes, Narrowneſs of the Lanes, and Number of People entring by one Stair, may therefore in ſome Meaſure apologize for neither Stairs nor Lanes being ſo clean as in ſome other Places where ſuch Crowds are not confined to ſuch a narrow Spot of Ground.

No River or Rivulet runs through the Town, or nearer it, than three Fourths of a Mile; but the City is plentifully provided with fine Spring-Water, conveyed about three Miles through leaden Pipes. The Markets are here plentifully furniſhed with Fleſhes, Fiſhes, Fruits, Herbs and Roots. The common Draught is ſmall Ale, ſold at Twopence a Pint, which is near four Pounds Apothecary Meaſure, the People of Faſhion having Plenty of Claret, and all other Sorts of Wines. All except the poorer Labourers uſe Wheat-bread; theſe indeed feed much on Oat-meal; and all Sorts burn Pit-coal in their Fires.

The Number of Inhabitants in *Edinburgh* and *Canongate* is reckoned to amount to ſome hundreds more than Thirty two thouſand, allowing the Number of thoſe that dye to be one thirtieth of the Whole, or eſtimating every Family to conſiſt of five Perſons; this we judge to be rather

ther too ſmall a Calcul for ſuch a crowded healthy Place as this is.

This curſory View of the City itſelf, is ſufficient for our Purpoſe; and therefore we ſhall next conſider its Neighbourhood.

At the upper End of the *High-ſtreet* there is a large Piece of waſte Ground (the *Caſtle-hill*) at the Weſt End of which, the Caſtle is raiſed on a very high Rock, and commands the whole Town. The *Nore-loch* begins on the North Side of the Foot of the Caſtle-Rock, and is continued at the Foot of the Ridge on which the Town ſtands, for about three Fourths of the High-Street, being at its Weſtmoſt half 300 Feet broad, and only 250 in its lower Half. The Ground on the North Side of this Loch is not ſo high as that on which the Town ſtands. The *Canongate* is overtop'd on its North-ſide by a contiguous craggy Hill (the *Calton-Craigs.*) Beyond the loweſt Extremity of the *Canongate*, a ſloping Plain runs Eaſtward to the Sea; but to the South of *Holy-rood-houſe*, two very high Hills (*Arthur's-Seat* and *Salzberry-craigs*) are at a very little Diſtance. The Ground to the South of the *Canongate* is rather higher than the Houſes there; but the Ground on the South of the *High-Town* is much on a Level with it, and has conſide-

rable Suburbs built on it; and towards the *Caſtle-hill*, the *High-ſtreet* is much higher than any Place at a Mile's Diſtance.

Thus we ſee the Caſtle higher than the Town between W. S. W. and W. b. S. The *Calton-craigs* is interpoſed between ſome part of the Town and the N. E. Winds, and protects the *Canongate* on the North; *Arthur's-Seat* and *Salzberry-Craigs* are a Defence from the E. and the South-ſide of the *Canongate* and *Cowgate* are defended by their low Situation: While the *High-Town* is open from the Weſt to the N. E. Point, and from the W. S. W. to the E. S. E. and all Parts of the Town are open to the Winds between N. E. and E.

At two Miles Diſtance from *Edinburgh*, Weſtward, are the *Corſtorphin-hills*, ſomewhat higher than the City. At a Mile's Diſtance from the Middle and lower Part of *Edinburgh*, where the Town of *Leith* is built, is the Firth of *Forth*, which is a Branch of the *German* Ocean, that begins to be land-lock'd at twenty Miles E. N. E. Diſtance, and gradually becomes narrower to the Place juſt now mentioned, where it is ſeven Miles in Breadth; and then the Shoar advancing Northward, while the Town is turned Southward, the Diſtance between the Town and Firth is gradually in-

creaſed. The Firth is ſtill more and more ſtraitned, till it is only named the *River of Forth*. The Tide however riſes at ſome more than Twenty Miles Diſtance from *Edinburgh*.

Ten Miles South from *Edinburgh* are very high Hills (*Soutry-Hills*) extended from Weſt Eaſtward; and at two Miles Diſtance on the South of the High-Town are two Hills (*Blackford* and *Braid*), higher than any part of the Town. And five Miles S. the great Range of *Pentland-hills*, which are extended many Miles S. W. take their Beginning; betwixt which and *Corſtorphin-Hills*, with ſome others beyond theſe, a fine ſpacious Plain is extended for a great many Miles Weſtward from the Caſtle, and is water'd with ſeveral Rivulets.

II. *A Deſcription of the* INSTRUMENTS *with which the Obſervations in the* Meteorological *Regiſter were made.*

THE *BAROMETER* is a ſimple portable one, the Tube of which is about a Fourth of an Inch Diameter in its Bore, and has a proportional large Ciſtern

for the ſtagnant Mercury. It is kept in a Chamber at the Height of 270 Feet above the Level of the Sea, as we calculated, by carrying this Inſtrument to the Sea Shoar, when the Mercury was perfectly ſtationary; and allowing, according to Dr. *Halley*'s Computation, (confirmed by Experiments we tried) 90 Feet perpendicular Height for every Tenth of an Inch, which the Mercury roſe in the Barometer, as we deſcended.

The different Heights of the Mercury in the Tube at the ſeveral Times of Obſervation are marked in the Regiſter by Inches and Tenths of Inches *Britiſh* Meaſure, which we have alſo made uſe of in determining the Degrees of the *Thermometer* and *Hygroſcope*.

The *THERMOMETER* uſed in our Obſervations, is the common Glaſs-ball and ſmall Tube, containing coloured *Alcohol*, and ſealed hermetically at the Top. The freezing Point is at 8 Inches, 2 Tenths; and the Heat of a Man in Health raiſes the Spirits to 22 Inches, 2 Tenths.

Our *HYGROSCOPE* is a *Whip-cord* with a Plummet appended, which we have endeavoured to make more capable of being compared with other ſuch Inſtruments, than is commonly practiſed, by aſcertaining two fix'd Points in the following Manner

Manner. We kept the Cord very near to a conſtant Fire for ſeveral Weeks, and afterwards put it into a Warm Oven till it was ſo dry that we could ſcarce make it ſtraight without breaking; then having put the End of it through the Noſe of a Funnel, to be ſecured within the Funnel, by the Iron Pin on which it was afterwards to be hung; we ſtuffed the Noſe of the Funnel with Sponge, and poured Water into the Funnel to trickle down along the Cord. We ſupplyed new Water conſtantly, till the Plummet would neither turn round, nor riſe any more with the Water which the Cord received in this Way, nor by ſoaking it in Water, nor by Steams of hot Water, but began to untwiſt as ſoon as we forbore ſupplying the Steams or Water. This Operation we repeated four Times, and always found that the Difference in the Length of our Cord, when fully dried, to its Length when fully wet, was ~~four~~ 14 Inches. The Point of greateſt Dryneſs on the Scale from which this Article of the Regiſter is taken, is at five Tenths of an Inch, and the Point of the fulleſt Wetneſs is 5/4 Inches, ~~5 Tenths.~~

We muſt likewiſe remark, That the *Thermometer* and *Hygroſcope* are kept in a ſquare Wainſcot Box, placed on the Weſt-

ſide

ſide, and without the Saſh of a North Window of the ſame Chamber where the Barometer is. The Box is very tight on every Side, when the Door of it is ſhut, except in the Side next the Saſh, where a great many large Holes are made. By the Situation and Make of this Box, neither the Sun or Rain, nor the Fire and Company in the Chamber, can have any bad Effect on the Inſtruments within it, and the Air has open free Acceſs to them.

The *DIRECTION OF THE WIND* is obſerved by the Weather-cock of the High-ſteeple of *St. Giles*'s *Church*, which is the only tolerable Place or Inſtrument for making this Sort of Obſervation, in a City ſituated as ours is.

We were reſolved to have determined the Force of the Wind very exactly, and for that Purpoſe had contrived two Inſtruments, one of which ſhou'd ſhow the Force at the Time when the Obſervations with the other Inſtruments were made; and the ſecond ſhould have pointed the greateſt Force the Wind had, between the Times of Obſervation. But not finding any Place for ſetting them up, where the Wind could have its full Effect, and the Obſervator could have eaſy Acceſs, we laid aſide that Deſign, and have followed Dr. *Juryn*'s Directions of judging by

by our Senſes, without the Help of any Machine, and in the Tables have marked the ſeveral Degrees thus, 0, 1, 2, 3, 4. By 0 is denoted a perfect Calm; by 1, ſuch a ſmall Wind as ſcarce moved the Leaves of Trees; by 4, a Hurricane; and by 2, 3, intermediate Forces.

The Inſtrument by which we have determined the DEPTH OF RAIN that falls, is, 1. A Funnel of 28 Inches diameter at its Brim, placed on the Top of a Garden-wall, about the Middle Height of the City, and free from all over-toping Houſes or Trees; and to prevent Evaporation as much as poſſible, a large Share of the Body and the Noſe of the Funnel are ſunk into a large very thick Box of Wood in which a narrow neck'd Receiver is placed, that allows the End of the Noſe of the Funnel to enter it. 2. The Gage in which the Water is meaſured, is a cylindrical Glaſs, whoſe Diameter is exactly 2. 8 Inches, or one Tenth of the Diameter of the Funnel, and has its Diviſions into Inches, and Tenths of Inches, exactly marked on its Length with a Diamond. The Difference of the Diameters of the Funnel and of the Gage, readily ſhows that one hundredth Part of what is meaſured in the Gage is only to be reckoned as the true Quantity that falls, which we

we have ſet down in Inches and Decimals of Inches.

III. *The Meteorological* REGISTER.

AFter what has been remark'd in the preceeding Account of the Inſtruments, there is very little more neceſſary to be explained, in order to underſtand the following Regiſter; for we expect it will be readily known, that we always uſe the *Julian* or Old Stile in determining the Months and Days of our Obſervations; and the Letters on Top of the Columns will eaſily explain what is contained in each. Nor is it difficult to follow out in the ſame continued Line every Obſervation that was made at the different Hours of the Forenoon (a. m.) or Afternoon (p. m.) ſet down in the ſecond Column. In the Column under Wind, the Point from which it blowed is marked by the Initial Letters of its common Name in the Compaſs, and its Force is determined by the Cyphers. The Appearance of the Sky is told in the Column of Weather; and where the pricked Lines are carried out to the laſt Column, the Receiver of the Rain was examined, but no Water was found.

JUNE

D.	Hour.	Baro. In. D.	Ther. In. D.	Hyg. I. D.	Wind. Dir. For.	Weather	Rain. In. D.
1	9 a. m	30 1	15 6	1 8	S.W.b.S. 1	Fair -	- -
	5 p.m	30 1	16 c	1 6	S.W.b.S. o	Cloudy	
2	9 a. m	29 9	15 3	1 7	S. W. 1	Cloudy	
	5 p.m.	29 9	15 9	1 7	W. 2	Cloudy	
3	10 a. m.	30 o	14 4	2 1	W. 1	Cloudy	
	4 p.m.	30 o	14 o	2 3	N. W. 1	Rain	
4	9 a. m.	29 9	12 2	1 7	N. W. 2	Cloudy	o, o63
	5 p.m.	30 o	13 o	1 5	N. W. 2	Cloudy	
5	9 a. m.	30 o	10 6	1 9	N.w.b.N. 2	Hail	o, o22
	4 p.m.	30 o	12 7	1 6	N. 1	Cloudy	
6	8 a. m.	30 o	12 4	2 1	N. W. 1	Cloudy -	- -
	4 p.m.	30 o	13 7	1 8	N. W. 1	Cloudy	
7	9 a. m.	30 o	12 2	2 3	N. E. 1	Cloudy	o, o23
	5 p.m	30 o	12 7	2 o	N. E. 1	Fair	
8	9 a. m.	30 o	13 5	2 1	W. 1	Cloudy -	- -
	5 p.m.	30 o	15 2	1 7	W.b. N. 1	Cloudy	
9	7 a. m.	30 o	13 2	1 9	W. 1	Cloudy -	- -
	5 p.m.	29 9	15 o	2 o	W. o	Cloudy	
10	7 a. m.	29 7	13 3	1 8	W. o	Cloudy -	- -
	5 p.m.	29 6	13 8	2 1	W. o	Rain	
11	11 a. m.	29 5	14 4	1 8	W. 1	Cloudy	o, o98
	7 p.m.	29 6	13 8	2 o	W. 1	Cloudy	
12	9 a. m.	29 8	13 3	2 3	N. E. 1	Cloudy -	- -
	6 p. m.	29 8	12 9	2 5	N. E. 1	Cloudy	
13	10 a. m.	29 7	13 o	2 6	N. E. 1	Cloudy -	- -
	4 p.m.	29 7	13 2	2 4	N. E. 1	Cloudy	
14	8 a. m	29 8	12 2	2 9	N. E. 1	Cloudy -	- -
	5 p.m.	29 8	13 1	2 6	N. E. 1	Fair	
15	10 a. m.	29 8	14 4	2 2	N. b.W. 1	Fair -	- -
	5 p.m	29 9	13 5	2 5	N. b. E. 1	Cloudy	
16	9 a. m.	29 9	12 2	3 2	N. E. 1	Cloudy -	- -
	4 p.m	30 o	12 9	3 o	E. b. N. 1	Hazy	
							o, 206

D.	Hour.	Baro. In.	D.	Ther In.	D.	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain.
											0,206
17	9 a. m.	30	0	12	0	2	9	E.	1	Cloudy	
	4 p. m.	30	0	12	3	2	8	E.	1	Cloudy	0,002
18	9 a. m.	30	0	11	5	3	1	E.	1	Cloudy	0,002
	5 p. m.	29	9	12	7	2	5	E.	1	Fair	
19	9 a. m.	29	8	12	7	2	5	E. b. N.	1	Fog	- -
	8 p. m.	29	6	12	8	2	8	E. b. N.	1	Fog	
20	9 a. m.	29	5	12	6	3	3	E. b. N.	1	Fog	0,064
	6 p. m.	29	5	12	9	2	6	E. b. N.	1	Cloudy	
21	8 a. m.	29	4	12	3	2	2	N. b. W.	1	Cloudy	0,075
	4 p. m.	29	4	13	5	1	5	N. b. W.	2	Cloudy	
22	8 a. m.	29	5	12	0	1	5	N. W.	2	Cloudy	- -
	5 p. m.	29	5	13	8	1	2	N. W.	1	Cloudy	
23	9 a. m.	29	5	12	1	2	0	S. E.	1	Rain	0,185
	5 p. m.	29	5	12	3	3	0	E. b. N.	1	Rain	
24	9 a. m.	29	5	13	7	2	8	E. b. N.	1	Fog	0,176
	4 p. m.	29	4	14	6	1	9	S. W.	2	Cloudy	
25	8 a. m.	29	2	13	9	2	0	S.	2	Cloudy	0,255
	7 p. m.	29	1	14	1	1	8	S.	2	Rainy	
26	9 a. m.	29	5	13	5	2	0	W.	0	Cloudy	0,010
	3 p. m.	29	6	13	3	2	0	W.	1	Fair	
27	9 a. m.	29	6	11	1	3	3	N. E.	2	Rain	
	4 p. m.	29	6	11	4	3	2	N. E.	2	Rain	
28	9 a. m.	29	5	11	4	3	7	N. E.	2	Fog	1,060
	5 p. m.	29	6	12	4	3	3	W.	1	Fog	
29	9 a. m.	29	6	13	0	3	0	W.	2	Cloudy	0,020
	4 p. m.	29	7	13	8	2	8	W.	2	Cloudy	
30	9 a. m.	29	7	14	0	2	1	W.	2	Fair	- -
	5 p. m.	29	7	14	0	1	7	W.	3	Fair	
H. at a Med.		29	5	13	2	2	3			Tot. Depth	2,055
Great. Height		30	1	16	0	3	7				
Least Height		29	1	10	6	1	2				

D.	Hour.	Baro. In. D.	Ther. In. D.	Hyg. I. D.	Wind. Dir. For.	Weather	Rain. In. D.
1	9 a. m.	29 9	13 7	1 7	W. 2	Fair	- -
	6 p. m.	29 9	13 6	1 7	W. b. N. 1	Fair	
2	10 a. m.	30 0	13 4	2 1	N. 1	Fair	- -
	5 p. m.	30 0	14 3	1 8	N. b. E. 1	Fair	
3	8 a. m.	30 0	13 9	1 8	N. b. W. 1	Fair	- -
	8 p. m.	30 0	15 2	1 4	W. 1	Fair	
4	9 a. m	30 0	14 6	1 6	W. b. N. 1	Fair	- -
	5 p. m.	30 0	16 2	1 2	W. b. N. 1	Fair	
5	9 a. m.	29 9	15 2	1 4	W. 1	Fair	- -
	5 p. m.	29 8	15 6	1 6	N. E. 1	Fair	
6	9 a. m	29 8	13 4	2 5	N. E. 1	Fair	- -
	8 p. m	29 8	13 4	2 4	N. E. 1	Cloudy	
7	9 a. m.	29 8	13 3	3 0	N. E. 1	Fog	- -
	4 p. m.	29 8	14 5	2 2	E. 1	Fair	
8	9 a. m.	29 8	14 3	2 2	N. E. 1	Fair	- -
	5 p. m.	29 9	14 9	2 0	N. E. 1	Fog	
9	9 a. m.	29 9	14 2	2 1	E. 0	Fair	0, 016
10	9 a. m.	30 0	14 1	1 8	W. 2	Fair	- -
	4 p. m.	30 0	15 5	1 5	W. 3	Fair	
11	9 a. m	29 9	13 9	1 6	W. 2	Fair	- -
	5 p. m.	29 9	14 9	1 4	W. 2	Fair	
12	8 a. m.	29 9	13 8	1 8	W. 2	Fair - -	- -
	8 p. m.	29 8	14 6	1 3	W. 1	Fair	
13	9 a. m.	29 8	14 2	1 8	W. 1	Rain	0, 012
	4 p. m.	29 7	14 3	1 6	N. b. E. 1	Fair	
14	9 a. m.	29 7	13 6	1 4	N. E. 0	Rain	0, 243
	5 p. m.	29 7	14 5	1 7	N. 1	Cloudy	
15	8 a. m.	29 6	13 5	1 9	W. 0	Rain	0, 080
	6 p. m.	29 6	14 5	1 3	W. 1	Fair	
16	9 a. m.	29 6	13 4	1 6	N. W 1	Cloudy	- -
	5 p. m.	29 7	14 1	1 4	N. b. E. 0	Cloudy	
17	9 a. m.	29 7	13 1	1 4	E. b. N. 1	Fair	- -
							0, 351

D.	Hour.	Baro. In.	D.	Ther. In.	D.	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain.
											0,351
	5 p. m.	29	7	13	7	1	2	N. E.	1	Cloudy	
18	10 a. m.	29	8	12	6	1	4	N. E.	1	Fair	0,027
	4 p. m.	29	9	14	0	1	2	N. E.	1	Fair	
19	9 a. m.	29	9	13	3	1	5	W. b. S.	1	Fair - -	- -
	6 p. m.	29	8	15	2	1	1	W.	1	Fair	
20	9 a. m.	29	7	14	2	1	4	S. b. W.	1	Cloudy -	- -
	5 p. m.	29	6	14	6	1	3	S.	1	Rain	
21	9 a. m.	29	4	14	9	1	8	S. b. W.	1	Cloudy	0,243
	5 p. m.	29	4	15	3	1	3	W. b. S.	1	Cloudy	
22	9 a. m.	29	5	14	1	1	6	W.	1	Cloudy	0,007
	6 p. m.	29	5	15	8	1	2	S. W.	1	Fair	
23	9 a. m.	29	5	14	6	1	8	S.	1	Rain	0,255
	6 p. m.	29	5	15	7	1	5	S.	0	Cloudy	
24	9 a. m.	29	6	13	7	1	9	W.	1	Cloudy-	- -
	5 p. m.	29	6	15	0	1	2	W.	1	Fair	
25	9 a. m.	29	6	14	6	1	7	N.	1	Cloudy	0,147
	4 p. m.	29	6	15	0	0	9	N.	0	Fair	
26	9 a. m.	29	7	13	4	1	5	W.	1	Fair	- -
	4 p. m.	29	8	15	0	0	9	W.	1	Fair	
27	9 a. m.	29	8	14	2	1	3	S. W.	0	Cloudy	
	5 p. m.	29	7	15	0	1	8	W.	1	Cloudy	0,243
28	9 a. m.	29	7	15	2	1	9	W.	1	Cloudy	0,010
	7 p. m.	29	8	15	0	1	4	S.	2	Cloudy	
29	9 a. m.	29	8	15	7	1	4	S. b. W.	1	Cloudy -	- -
	5 p. m.	29	8	15	1	1	1	S. b. W.	1	Cloudy	
30	9 a. m.	29	8	15	5	1	5	S. b. E.	1	Cloudy	
	5 p. m.	29	7	16	0	1	3	E.	1	Thund.	0,065
31	9 a. m	29	7	14	5	2	6	E. b. N.	1	Mist	
	5. p. m.	29	6	14	2	2	5	E.	1	Thund.	0,193
Ht. at a Med.		29	7	14	2	1	6			Tot. Depth	1,541
Great. Height		30	0	16	2	3	0				
Leaſt Height		29	4	12	6	0	9				

D	Hour.	Baro. In. D.	Ther. In. D	Hyg. I. D.	Wind. Dir. For.	Weather	Rain. In. D.
1	9 a. m.	29 6	15 4	2 0	S. E. 1	Cloudy	0, 044
	5 p. m	29 6	15 5	2 0	S. E. 1	Rain	
2	9 a. m.	29 5	13 2	3 8	E. 1	Rain	0, 736
	5 p. m.	29 6	14 8	3 1	E. 1	Fair	
3	9 a. m.	29 8	13 8	2 9	E. 1	Fair	0, 003
	3 p. m.	29 8	14 9	2 6	E. 1	Fair	
4	9 a. m.	29 9	13 9	3 1	E. 1	Cloudy	- -
	4 p. m.	29 9	13 8	2 5	E. 1	Fair	
5	9 a. m.	29 9	13 1	2 9	E. 1	Cloudy	- -
	5 p. m.	29 9	14 0	2 4	E. 1	Cloudy	
6	9 a. m.	29 9	13 7	2 6	E. 1	Fair	- -
	4 p. m.	29 9	14 6	2 1	E. 1	Fair	
7	8 a. m.	29 9	14 0	2 6	E. 1	Cloudy	- -
	4 p. m.	29 9	15 5	2 0	E. 1	Fair	
8	9 a. m.	29 9	14 8	2 0	N. 1	Cloudy	- -
	4 p. m.	29 8	15 7	1 5	N. 1	Fair	
9	9 a. m.	29 5	13 8	1 8	N. W. 2	Fair	- -
	4 p. m.	29 4	13 4	1 4	N. W. 2	Fair	
10	9 a. m.	29 5	12 7	1 3	N. 2	Cloudy	- -
	4 p. m.	29 7	13 2	1 2	N. W. 1	Fair	
11	9 a. m.	29 9	11 9	1 2	N. W. 1	Fair	- -
	4 p. m.	29 9	14 1	1 0	N. W. 1	Fair	
12	9 a. m.	30 0	13 0	1 4	N. W. 1	Fair	- -
	4 p. m.	30 1	14 9	1 1	W. 1	Fair	
13	8 a. m.	30 1	12 7	1 4	W. 1	Fair	- -
	4 p. m.	30 1	14 8	1 0	W. b. N. 2	Fair	
14	8 a. m.	30 1	14 0	1 4	W. b. N. 1	Fair	- -
	5 p. m.	30 1	14 8	1 2	N. 1	Fair	
15	9 a. m.	30 1	13 5	1 8	N. E. 1	Cloudy	- -
	4 p. m.	30 1	13 7	1 5	E. b. N. 1	Cloudy	
16	8 a. m.	30 1	12 6	1 5	E. b. N. 1	Cloudy	- -
	4 p. m.	30 0	12 9	1 9	E. b. N. 1	Cloudy	

0, 783

D.	Hour.	Baro. In.	D	Ther. In.	D	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain.
											0,783
17	9 a. m.	30	0	13	4	1	7	N. E.	1	Cloudy	0,008
	5 p. m.	30	0	13	9	1	1	S. b. E.	1	Fair	
18	8 a. m.	30	0	12	9	2	3	E.	1	Fair	- -
	5 p. m	30	0	13	5	1	7	N. E.	2	Fair	
19	9 a. m.	30	1	13	1	2	0	E.	1	Cloudy	- -
	5 p. m.	30	1	13	2	1	7	E. b. N.	1	Fair	
20	8 a. m	30	1	12	4	1	8	E. b. N.	1	Cloudy	- -
	5 p. m.	30	0	13	2	1	6	E. b. N.	1	Cloudy	
21	8 a. m.	30	0	12	8	2	0	E. b. N.	1	Cloudy	- -
	4 p. m.	29	9	13	0	1	9	E. b. N.	1	Cloudy	
22	8 a. m.	29	8	12	8	1	8	E. b. N.	1	Cloudy	- -
	4 p. m.	29	6	12	7	2	2	E. b. N.	2	Cloudy	
23	9 a. m.	29	5	13	1	2	9	E. b. N.	2	Cloudy	0,069
	6 p. m.	29	5	13	2	3	7	N. E.	1	Rain	
24	8 a. m.	29	4	12	6	3	8	N. E.	1	Cloudy	0,209
	5 p. m.	29	5	12	8	2	7	N. E.	1	Cloudy	
25	8 a. m.	29	6	12	2	2	3	E. b. N.	1	Cloudy	- -
	4 p. m.	29	6	12	8	1	7	E.	1	Cloudy	
26	8 a. m.	29	6	12	0	2	4	E.	2	Rain	0,164
	5 p. m.	29	6	11	9	2	6	E.	1	Rain	
27	9 a. m.	29	4	12	6	3	8	N. b. E.	1	Fair	0,485
	5 p. m.	29	4	13	5	2	5	N. b. E.	0	Fair	
28	9 a. m.	29	4	12	8	3	5	N. b. E.	1	Mist.	0,033
	5 p. m.	29	4	13	8	3	3	N. b. E.	1	Fog	
29	9 a. m.	29	4	13	6	2	8	N. b. E.	0	Fog	
	6 p. m.	29	4	13	5	3	3	N. b. E.	0	Fog	
30	8 a. m.	29	4	13	3	3	4	N. E.	0	Cloudy	0,083
	5 p. m.	29	4	13	8	3	3	E. b. N.	1	Mist	
31	8 a. m.	29	4	13	7	2	9	W.	1	Cloudy	0,031
	5 p. m.	29	4	14	6	2	1	S. W.	1	Cloudy	
Ht. at a Med.		29	7	13	5	2	2			Total Depth	1,857
Great. Height		30	1	15	7	3	8				
Leaſt Height		29	4	11	9	1					

D.	Hour.	Baro. In.	D.	Ther. In.	D.	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain. In.	D.
1	9 a. m.	29	4	13	6	2	3	S. W.	1	Cloudy	0,	025
	6 p. m.	29	4	13	7	2	2	S.	0	Fair		
2	8 a. m.	29	3	14	7	2	3	S. W.	2	Rain		
	5 p. m.	29	2	13	5	2	1	S. W.	2	Variable	0,	566
3	8 a. m.	29	2	12	8	2	2	W. b. S.	2	Variable		
	4 p. m.	29	2	13	9	1	6	W. b. S.	3	Fair		
4	9 a. m.	29	1	13	3	2	0	W. b. S.	3	Lowring	0,	195
	5 p. m.	29	1	12	9	1	7	W. b. S.	3	Variable		
5	9 a. m.	29	3	12	0	1	7	W. b. N.	4	Fair		
	6 p. m	29	5	12	8	1	5	W. b. N.	3	Cloudy		
6	9 a. m.	29	4	13	0	1	7	W.	3	Clear	0,	091
	4 p. m.	29	4	13	0	1	3	W.	3	Cloudy		
7	8 a. m.	29	4	11	7	1	7	W.	3	Cloudy		-
	5 p. m.	29	5	13	2	1	2	N. W.	2	Cloudy		
8	9 a. m.	29	7	11	3	1	3	N. W.	2	Clear		-
	5 p. m	29	8	12	4	1	4	N. b. W.	2	Variable		
9	8 a. m.	30	0	10	7	1	4	W.	1	Fair		-
	4 p. m.	30	0	12	5	1	2	W.	1	Cloudy		
10	8 a. m.	30	0	12	7	1	1	W.	2	Clear		-
	5 p. m.	30	0	13	3	1	8	W.	1	Cloudy		
11	8 a. m.	30	0	12	4	2	0	W. b. S.	1	Clear		-
	4 p. m.	30	0	13	6	1	3	W.	2	Clear		
12	9 a. m.	29	9	13	0	1	7	S. W.	1	Cloudy	0,	022
	5 p. m.	29	8	13	6	1	7	S. W.	2	Variable		
13	8 a. m.	29	9	13	1	2	0	W.	1	Fair		-
	5 p. m	30	0	14	1	1	4	W.	1	Fair		
14	8 a. m.	30	1	13	0	2	0	W.	1	Fair		-
	4 p. m.	30	2	14	5	1	7	W.	1	Fair		
15	8 a. m.	30	1	13	2	1	8	W. b. N.	1	Fair		-
	6 p. m.	30	1	14	0	1	8	N. W.	0	Fair		
16	9 a. m.	30	0	13	0	1	8	S. W.	0	Fair		-
	5 p. m.	29	9	14	6	1	4	S. W.	0	Clear		

0, 899

D.	Hour.	Baro. In.	D.	Ther. In.	D.	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain.
											0, 899
17	8 a. m.	29	8	13	6	1	6	S. W.	2	Fair	- -
	4 p. m.	29	8	13	2	1	4	W.	3	Cloudy	
18	8 a. m.	29	6	12	5	1	5	S. W.	3	Cloudy	0, 003
	5 p. m.	29	4	12	4	1	5	S. W.	2	Variable	
19	8 a. m.	29	6	11	9	1	5	W.	2	Clear	0, 150
	4 p. m.	29	7	12	9	1	5	W.	2	Cloudy	
20	8 a. m.	29	7	13	1	1	7	S. W.	2	Cloudy	0, 054
	5 p. m.	29	7	13	6	1	5	S. W.	1	Cloudy	
21	8 a. m.	29	6	13	6	1	6	S. b. W.	2	Fair	- -
	4 p. m.	29	5	14	5	1	5	S. b. W.	3	Fair	
22	8 a. m.	29	6	12	2	2	2	W.	1	Rain	
	5 p. m.	29	5	12	0	2	4	N. E.	1	Variable	
23	9 a. m.	29	6	11	2	2	5	W. b. N.	1	Rain	0, 763
	5 p. m.	29	7	11	9	2	0	W. b. N.	1	Fair	
24	8 a. m.	29	9	11	2	2	0	N. W.	1	Fair	0, 030
	6 p. m.	29	9	11	7	1	8	N. W.	1	Fair	
25	8 a. m.	29	8	11	3	1	7	S. E.	1	Fair	- -
	5 p. m.	29	7	12	1	1	7	S. E.	1	Fair	
26	9 a. m.	29	6	12	8	2	2	S. E.	1	Cloudy	- -
	4 p. m.	29	5	14	0	1	9	S. E.	1	Cloudy	
27	9 a. m.	29	3	13	0	2	0	S. E.	1	Cloudy	0, 045
	5 p. m.	29	2	13	2	1	8	S.	1	Variable	
28	9 a. m.	29	4	12	5	1	8	S. b. W.	1	Fair	0, 012
	4 p. m.	29	2	13	0	1	7	S.	1	Rain	
29	9 a. m.	29	0	13	0	1	6	W. b. S.	4	Stormy	0, 155
	5 p. m.	29	4	13	1	1	6	W.	3	Clear	
30	9 a. m.	29	3	14	3	1	9	S.	2	Cloudy	0, 010
	3 p. m.	29	3	14	3	1	5	S. W.	3	Cloudy	
Ht. at a Med.		29	6	12	9	1	7			Total Depth	2, 021
Great. Height		30	2	14	7	2	5				
Least Height		29	0	10	7	1	1				

D.	Hour.	Baro. In.	Đ.	Ther. In.	D.	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain In.	D.
1	9 a. m.	29	4	12	1	1	8	S. W.	3	Variable	0,	085
	5 p. m.	29	6	12	8	1	8	S. W.	2	Variable		
2	9 a. m.	29	6	13	6	1	9	S. W.	3	Variable		
	4 p. m.	29	7	14	3	1	7	S. W.	3	Cloudy		
3	9 a. m.	29	9	12	2	2	0	W.	2	Clear		
	4 p. m.	29	9	13	0	1	5	W.	2	Clear		
4	9 a. m.	29	8	12	0	1	4	W.	1	Rain	0,	390
	5 p. m.	29	8	11	7	1	6	N. W.	1	Variable		
5	9 a. m.	29	0	10	5	2	5	S. W.	1	Fair	0,	007
	4 p. m.	29	8	11	8	1	8	S. W.	2	Variable		
6	8 a. m.	29	7	11	7	2	2	W.	2	Fair	-	-
	4 p. m.	29	8	12	1	1	6	W.	2	Fair		
7	8 a. m.	29	6	12	4	2	2	S. W.	3	Cloudy	-	-
	5 p. m.	29	5	13	1	2	0	W.	3	Variable		
8	9 a. m.	29	7	11	5	1	5	W.	3	Clear		
	5 p. m.	29	9	10	7	1	3	N.	3	Clear	-	-
9	8 a. m.	30	0	9	4	1	3	N.	2	Mist	-	-
	4 p. m.	30	0	11	2	1	4	W.	1	Cloudy		
10	9 a. m.	29	7	12	6	2	3	W. b. S.	2	Cloudy	-	-
	4 p. m.	29	6	13	0	2	0	W.	2	Cloudy		
11	8 a. m.	29	8	10	0	1	4	N. E.	2	Clear	-	-
	5 p. m.	29	9	10	7	1	5	E. b. N.	1	Clear		
12	9 a. m.	30	0	10	6	1	6	S. E.	2	Cloudy	-	-
	5 p. m.	30	0	10	5	1	5	S. E.	2	Clear		
13	8 a. m.	29	8	10	2	1	7	S. E.	1	Fair	-	-
	4 p. m.	29	7	11	5	1	5	S. E.	1	Fair		
14	8 a. m.	29	6	11	6	2	5	S. E.	1	Fair	0,	025
	9 p. m.	29	5	12	2	2	5	. . . .		Rain		
15	9 a. m.	29	5	11	9	2	3	W.	1	Fair	0,	259
	4 p. m.	29	5	12	4	1	6	W.	1	Clear		
16	9 a. m.	29	5	11	2	2	2	S. W.	1	Fair	0,	060
	5 p. m.	29	5	12	1	1	7	S. W.	1	Rain		
											0,	826

D	Hour.	Baro. In.	D.	Ther. In.	D.	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain.
											0,826
17	9 a.m.	29	4	13	7	1	8	S. W.	3	Cloudy	- -
	4 p.m.	29	5	13	2	1	8	S. W.	1	Cloudy	
18	8 a.m.	29	7	12	4	2	0	S. W.	1	Clear	- -
	4 p.m.	29	7	13	2	2	0	S.	0	Cloudy	
19	8 a.m.	29	6	11	7	1	9	S. b. E.	3	Fair	0,062
	5 p.m	29	8	11	6	1	6	S.	1	Fair	
20	9 a.m.	29	9	10	7	1	9	S. b. E.	1	Cloudy	0,045
	5 p.m.	29	9	11	4	2	0	S. b. E.	0	Cloudy	
21	9 a.m.	29	9	11	4	2	0	S. b. E.	1	Cloudy	- -
	4 p.m.	29	8	11	4	1	9	S. b. E.	1	Cloudy	
22	8 a.m.	29	8	10	3	1	9	S. b. W.	1	Fair	0,009
	5 p.m.	29	8	11	3	1	8	S. b. W.	1	Fair	
23	9 a.m.	29	6	11	2	1	7	S.	2	Cloudy	- -
	4 p.m.	29	5	12	1	1	8	S.	2	Rain	
24	9 a.m.	29	7	10	3	2	0	S.	1	Clear	
	4 p.m.	29	7	11	4	1	9	S.	1	Cloudy	
25	9 a.m.	29	6	11	5	2	3	S.	1	Cloudy	
	5 p.m.	29	5	11	4	2	0	S.	1	Cloudy	
26	9 a.m.	29	5	11	5	2	2	S.	1	Fog	0,085
	4 p.m.	29	4	12	0	2	1	S. E.	1	Cloudy	
27	9 a.m.	29	5	11	7	2	4	S. W.	1	Rain	
	4 p.m.	29	6	11	4	2	7	E.	1	Rain	
28	9 a.m.	29	7	12	5	3	7	N. E.	2	Mist	0,246
	4 p.m.	29	7	12	0	3	4	S. E.	1	Cloudy	
29	9 a.m.	29	6	12	1	3	1	S. E.	1	Cloudy	0,010
	5 p.m.	29	5	12	2	3	0	S. E.	1	Cloudy	
30	9a.m.	29	3	11	8	2	8	S. E.	2	Cloudy	
	4 p.m.	28	9	11	9	2	7	S. E.	3	Cloudy	
31	9 a.m.	28	8	10	5	2	4	S. b. W.	1	Rain	0,196
	4 p.m.	28	8	10	1	2	3	S. W.	1	Cloudy	
H. at a Med.		29	3	11	7	2	0			Total Depth	1,479
Great. Height		30	0	14	3	3	4				
Least Height		28	8	10	8	1	3				

D.	Hour.	Baro. In. D.	Ther. In. D.	Hyg. I. D.	Wind. Dir. For.	Weather	Rain. In. D.
1	9 a. m.	28 8	8 7	2 4	S. W. 1	Clear	0,273
	4 p.m.	28 9	9 3	2 4	S. W. 1	Clear	
2	8 a. m.	28 9	9 2	2 5	W. 2	Cloudy	- -
	4 p.m.	29 1	9 0	2 4	W. 2	Clear	
3	9 a. m.	29 1	9 5	2 5	W. 2	Clear	
	4 p.m.	29 2	10 4	2 4	W. 2	Cloudy	
4	9 a. m	29 2	10 6	2 1	W. 3	Clear	0,025
	4 p.m.	29 3	10 5	2 0	W. 2	Clear	
5	9 a. m.	29 4	10 0	2 3	W. 2	Cloudy	0,034
	4 p.m.	29 3	10 2	2 3	W. 2	Cloudy	
6	9 a. m	29 7	8 5	2 4	W. 2	Clear	- -
	4 p.m	29 2	9 0	2 0	N. W. 2	Clear	
7	9 a. m.	29 3	8 4	2 0	N. W. 1	Clear	- -
	4 p.m	29 4	8 6	2 0	N. W. 1	Clear	
8	9 a. m	29 4	8 6	2 2	N.W.N. 1	Mist	- -
	3 p.m	29 3	9 2	2 2	N. E. 1	Clear	
9	9 a. m	29 3	9 9	2 4	E. 2	Cloudy	0,093
	4 p.m.	29 3	9 9	2 4	E. 2	Cloudy	
10	9 a. m.	29 4	10 1	2 5	N. E. 3	Rain	0,254
	3 p.m	29 4	10 1	3 0	N. E. 3	Rain	
11	9 a. m	29 6	10 0	3 8	N. E. 2	Cloudy	
	3 p.m.	29 7	10 2	3 4	N. E. 2	Cloudy	
12	9 a. m.	29 6	10 0	3 1	S. W. 2	Cloudy	
	4 p.m.	29 5	10 6	2 6	W. 2	Cloudy	0,286
13	9 a. m.	29 7	9 7	2 8	W. 1	Clear	- -
	3 p.m.	29 7	10 6	2 6	W. 1	Cloudy	
14	9 a. m.	29 5	12 3	2 8	W. 3	Cloudy	- -
	4 p.m.	29 6	12 6	2 9	W. 3	Cloudy	
15	9 a. m.	29 8	12 0	3 0	W. 3	Clear	- -
	4 p.m.	29 9	12 2	2 9	W. 1	Cloudy	
16	9 a. m.	30 0	11 1	2 9	W. 1	Fog	- -
	2 p.m.	29 9	11 8	2 8	W.b. S. 1	Cloudy	

0,965

D.	Hour.	Baro. In.	D.	Ther. In.	D.	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain, 0, 965
17	9 a. m.	29	8	11	5	2	8	S. W.	1	Cloudy	- -
	2 p. m.	29	7	11	8	2	7	S. W.	1	Cloudy	
18	9 a. m.	28	0	11	6	2	8	W.	2	Clear	
	2 p. m.	29	8	12	0	2	6	W.	2	Cloudy	
19	9 a. m.	29	5	10	9	2	5	W.	3	Cloudy	
	2 p. m.	29	4	10	6	2	2	W.	3	Cloudy	
20	8 a. m.	29	8	9	1	2	0	N. W.	1	Clear	0, 021
	2 p. m.	29	9	9	9	2	0	W.	1	Cloudy	
21	11 a. m.	29	9	11	2	2	1	W.	2	Clear	
	4 p. m.	29	8	11	1	2	0	W.	2	Clear	
22	9 a. m.	29	6	10	3	2	1	W.	3	Clear	
	3 p. m.	29	6	10	3	2	0	W.	3	Cloudy	
23	9 a. m.	29	5	8	9	2	3	W.	2	Clear	0, 203
	2 p. m.	29	5	9	5	2	1	W.	3	Cloudy	
24	9 a. m.	29	7	8	4	2	0	N. W.	2	Cloudy	
	3 p. m.	29	8	8	8	2	0	N. W.	3	Cloudy	
25	9 a. m.	29	9	7	8	2	0	N. W.	2	Froſt	- -
	2 p. m.	29	9	8	6	1	9	N. W.	2	Fair	
26	9 a. m.	30	1	7	4	1	9	N. W.	2	Froſt	
	3 p. m.	30	1	8	3	1	4	N. W.	2	Fair	
27	9 a. m.	30	3	8	0	1	2	W.	1	Froſt	
	2 p. m.	30	3	8	4	2	2	W.	1	Cloudy	
28	9 a. m.	30	1	9	2	2	1	S. E.	1	Fair	
	4 p. m.	30	0	9	2	2	1	E.	1	Fair	
29	9 a. m.	29	6	9	2	2	2	E.	1	Fog	
	2 p. m.	29	5	9	2	2	3	E. b. S.	1	Foggy	
30	9 a. m.	29	5	9	4	2	0	S. W.	2	Cloudy	
	4 p. m.	29	5	9	5	2	1	S. W.	2	Cloudy	0, 233
Heat a Med.		29	8	9	8	2	3			Total Depth	1, 422
Great Height		30	3	12	6	3	8				
Leaſt Height		28	0	7	4	1	2				

D.	Hour.	Baro. In.	D.	Ther. In.	D.	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain. In.	D.
1	9 a. m	29	8	8	2	2	3	W. b. S.	1	Clear	0,075	
	2 p.m.	29	8	9	1	2	0	W. b. S.	1	Clear		
2	9 a. m	29	9	9	8	2	4	S. W.	2	Cloudy	-	-
	2 p. m.	29	9	11	0	2	5	S. W.	3	Cloudy		
3	9 a. m.	29	6	9	9	2	4	W.	3	Clear	-	-
	2 p. m.	29	6	10	2	2	1	W.	3	Clear		
4	9 a. m.	29	5	9	0	2	6	W.	2	Fog		
	2 p. m.	29	5	9	9	2	4	W.	2	Fog		
5	9 a. m.	29	3	11	7	2	9	W.	4	Cloudy		
	3 p. m.	29	2	11	4	2	3	W.	4	Clear		
6	9 a. m.	29	4	9	4	2	2	W.	2	Clear	0,062	
	2 p. m.	29	4	9	7	2	2	W.	2	Clear		
7	9 a. m.	28	9	8	9	3	5	N.	3	Rain		
	2 p. m.	29	0	8	5	3	4	N.	2	Fair		
8	9 a. m	29	4	7	3	2	3	W.	2	Froſt		
	2 p. m.	29	5	7	6	2	3	W.	2	Froſt		
9	9 a. m	29	3	8	3	2	3	S. E.	3	Stormy		
	2 p. m.	29	0	9	4	2	4	S.	3	Stormy	1,175	
10	2 p. m.	29	2	10	2	2	2	W.	3	Cloudy	-	-
11	9 a. m	29	7	10	6	2	6	S. W.	2	Cloudy		
	2 p. m.	29	8	11	2	2	5	W.	2	Clear		
12	9 a. m.	29	6	10	3	2	1	W.	4	Lowring	0,173	
	3 p. m.	29	6	9	3	2	2	W.	4	Cloudy		
13	9 a. m.	29	4	10	9	2	4	W.	3	Cloudy	-	-
	2 p. m.	29	4	11	4	2	1	W.	3	Cloudy		
14	9 a. m.	29	5	9	4	1	7	N. W.	4	Clear	0,081	
	2 p. m.	29	7	9	3	1	8	N. W.	3	Fair		
15	9 a. m.	29	9	7	8	1	8	S.	1	Froſt	0,030	
	2 p. m.	29	8	8	8	1	7	S.	1	Cloudy		
16	9 a. m.	29	6	9	2	2	4	W.	1	Clear	0,070	
	2 p. m.	29	6	9	8	2	3	W.	1	Clear		
17	9 a. m.	29	3	9	5	2	3	S. W.	1	Cloudy		
											1,666	

D.	Hour.	Baro. In.	Baro. D.	The In.	The D.	Hyg. I.	Hyg. D.	Wind. Dir.	Wind. For.	Weather	Rain.
											1,666
	4 p.m.	29	2	8	8	2	4	W.	1	Snow	
18	9 a.m.	29	4	8	8	2	5	N.	3	Rain	0,092
	2 p.m.	29	3	9	3	2	0	N.	2	Cloudy	
19	9 a.m.	29	8	8	3	2	0	N.	2	Cloudy	- -
	2 p.m.	29	8	9	0	2	0	N.	2	Cloudy	
20	9 a.m.	29	8	8	5	2	4	N. W.	1	Cloudy	
	2 p.m.	29	8	8	8	2	1	N. W.	1	Clear	
21	9 a.m.	30	0	7	5	2	2	W.	1	Froſt	0,237
	2 p.m.	30	0	8	5	2	3	W.	2	Clear	
22	9 a.m.	30	1	8	8	2	9	E.	1	Fog	
	2 p.m.	30	2	9	3	2	8	E.	2	Clear	
23	9 a.m.	29	9	8	7	2	5	S. E.	1	Fog	
	2 p.m.	29	9	8	8	2	6	S E.	1	Clear	
24	8 a.m.	29	8	8	3	2	8	N.	2	Cloudy	
	2 p.m.	29	7	8	4	2	5	N. W.	2	Clear	
25	8 a.m	29	9	8	8	2	5	W.	2	Rain	1,027
	2 p.m.	29	8	9	2	2	6	N. W.	2	Cloudy	
26	9 a.m.	29	6	6	7	2	0	W.	2	Froſt	- -
	3 p.m.	29	5	6	8	2	1	N. W.	2	Snow	
27	9 a.m.	29	4	6	3	1	9	W.	2	Clear	
	2 p.m.	29	4	6	3	1	9	W.	2	Clear	
28	9 a.m.	29	5	5	7	2	1	W.	2	Froſt	0,080
	2 p.m.	29	5	6	9	2	0	W.	2	Cloudy	
29	8 a.m.	29	1	7	6	2	8	W.	1	Snow	- -
	2 p.m.	29	1	9	2	3	2	W.	1	Cloudy	
30	9 a.m.	29	2	10	9	3	0	S. W.	2	Cloudy	
	2 p.m.	29	3	11	5	2	8	S.	3	Cloudy	
31	9 a.m.	29	7	11	3	2	6	S. W.	1	Cloudy	0,023
	2 p.m.	29	7	11	4	2	3	S. W.	1	Fair	
H. at a Med.		29	5	9	0	2	3			Total Depth	3,125
Great. Height		30	2	11	7	3	5				
Leaſt Height		28	9	5	7	1	7				

D.	Hour.	Baro. In.	D.	Ther. In.	D.	Hyg I.	D.	Wind. Dir.	For.	Weather	Rain. In.	D.
1	9 a. m.	29	8	10	3	1	8	E.	1	Fair	0,	035
	2 p. m.	29	8	10	5	1	9	S. E.	2	Fair		
2	9 a. m.	30	0	8	9	2	5	S. E.	2	Fog	-	-
	3 p. m.	30	0	9	1	2	6	S. E.	2	Fog		
3	9 a. m.	30	1	8	4	2	5	S. E.	2	Fog	-	-
	3 p. m.	30	1	8	6	2	4	S. E.	2	Clear		
4	9 a. m.	30	2	8	6	2	2	S. E.	1	Fog		
	2 p. m.	30	2	9	0	2	2	S. E.	1	Fog		
5	9 a. m.	30	2	9	3	3	4	E.	2	Miſt	0,	023
	2 p. m.	30	2	9	1	3	2	N. E.	2	Cloudy		
6	9 a. m.	30	0	9	3	3	5	N. E.	2	Rain		
	2 p. m.	29	9	9	4	3	0	N. E.	2	Clear		
7	9 a. m.	29	6	8	4	2	3	W.	2	Cloudy		
	2 p. m.	29	5	8	3	3	0	W.	2	Snow		
8	9 a. m.	29	3	7	5	2	3	W.	2	Froſt		
	2 p. m.	29	3	7	7	2	2	W. b. N.	2	Froſt		
9	9 a. m	29	4	7	2	2	2	W.	2	Froſt	0,	071
	4 p. m	29	4	7	8	2	4	W.	2	Cloudy		
10	9 a. m.	29	7	6	8	2	1	W.	2	Froſt	-	-
	2 p. m.	29	8	7	4	2	0	W.	1	Froſt		
11	9 a. m.	29	7	7	5	2	4	S. E.	2	Fair	-	-
	2 p. m.	29	7	8	4	2	5	S. E.	2	Cloudy		
12	9 a. m.	29	7	8	5	2	9	S. E.	2	Fog		
	2 p. m.	29	8	9	2	2	8	S. E.	2	Cloudy		
13	9 a. m.	29	7	8	2	2	8	S. b. E.	2	Fog		
	4 p. m.	29	7	8	2	2	8	S. b. E.	2	Fog		
14	9 a. m.	29	7	6	9	2	8	S.	2	Froſt	0,	173
	2 p. m.	29	7	7	7	2	5	S.	2	Froſt		
15	9 a. m.	29	5	6	9	3	0	S. E.	1	Froſt		
	2 p. m.	29	5	8	1	3	2	S. E.	2	Fog		
16	9 a. m.	29	4	7	7	3	2	S. E.	2	Froſt	0,	083
	4 p. m.	29	3	8	5	2	5	S. E.	2	Fog		
											0,	385

D.	Hour.	Baro. In.	D	Ther In.	D	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain.
											0, 385
17	9 a. m	29	0	8	9	2	8	E.	2	Fog	
	2 p. m.	29	0	9	1	3	0	E.	2	Rain	
18	9 a. m.	29	1	8	7	3	8	N. E.	3	Fog	
	2 p. m.	29	2	8	6	3	5	N. E.	3	Rain	
19	9 a. m	29	4	8	0	2	5	E.	2	Snow	
	2 p. m	29	5	8	4	2	3	E.	2	Fair	
20	9 a. m.	29	7	7	0	2	2	W.	2	Froſt	0, 158
	2 p. m.	29	7	7	6	2	2	W.	2	Froſt	
21	9 a. m	29	8	7	2	2	2	W.	2	Froſt	
	4 p. m.	29	7	8	1	2	2	W.	2	Froſt	
22	9 a. m.	29	7	9	0	2	8	W.	2	Freſh	0, 035
	2 p. m.	29	7	9	1	2	6	W.	2	Freſh	
23	9 a. m.	29	7	8	7	2	5	W.	2	Fair	- -
	4 p. m.	29	7	9	0	2	5	W.	1	Fair	
24	9 a. m.	29	7	8	5	2	6	S.	2	Fair	0, 120
	2 p. m.	29	6	9	6	2	5	S.	2	Fair	
25	9 a. m.	29	4	11	0	2	5	S.	3	Rain	
	2 p. m.	29	4	11	4	2	5	S. W.	3	Rain	
26	9 a. m.	29	3	11	4	2	5	S. W.	2	Cloudy	
	4 p. m.	29	2	11	5	2	3	S. W.	3	Cloudy	
27	9 a. m.	29	1	10	2	2	3	S. b. W.	2	Fair	0, 289
	2 p. m.	29	1	10	8	2	2	S.	2	Fair	
28	9 a. m.	28	9	9	8	2	7	S. E.	1	Rain	0, 052
	4 p. m.	29	0	10	6	2	6	S. W.	2	Fair	
29	9 a. m.	29	1	9	3	2	5	S. E.	2	Fair	
	4 p. m.	29	1	10	3	2	4	S. E.	2	Cloudy	
30	9 a. m.	29	3	9	9	2	8	S. W.	2	Cloudy	
	4 p. m.	29	4	10	2	2	7	S. W.	2	Cloudy	
31	9 a. m.	29	5	10	4	2	6	S. b. W.	2	Cloudy	0, 244
	2 p. m.	29	5	11	5	2	3	S. b. W.	2	Fair	
H. at a Med.		29	3	8	8	2	5			Total Depth	1, 283
Great. Height		30	2	11	5	3	8				
Leaſt Height		28	9	6	8	1	8				

D.	Hour.	Baro. In.	D.	Ther. In.	D.	Hyg I.	D.	Wind. Dir.	For.	Weather	Rain. In.	D.
1	9 a. m.	29	6	11	6	2	5	S. W.	2	Cloudy	0,	053
	4 p.m	29	7	11	3	1	8	S. W.	2	Cloudy		
2	9 a. m.	29	7	11	0	2	1	S. b. W.	2	Fair	0,	027
	2 p.m.	29	6	11	8	2	1	S. b. W.	3	Fair		
3	9 a. m.	29	6	11	9	2	2	S. W.	2	Fair	0,	063
	2 p.m	29	6	12	5	2	2	S. W.	3	Fair		
4	9 a. m	29	5	12	0	2	3	S. W.	3	Rain	-	-
	2 p.m	29	4	12	4	2	2	S. W.	3	Cloudy		
5	9 a. m.	29	6	10	1	2	7	E.	1	Rain	0,	205
	4 p.m	29	6	9	9	3	0	E.	1	Cloudy		
6	9 a. m	29	6	10	9	2	6	W.	2	Cloudy	0,	110
	4 p.m	29	0	11	3	2	5	W.	3	Cloudy		
7	9 a. m	29	0	8	6	2	2	S. E.	2	Snow	0,	197
	3 p.m	28	8	9	8	2	5	W.	3	Fair		
8	9 a. m	28	7	9	0	2	6	N. E.	1	Fair		
	2 p.m	29	0	8	9	2	3	N.	2	Fair		
9	9 a. m	29	4	9	2	2	2	S.	3	Cloudy	0,	262
	3 p.m.	29	3	10	9	2	4	S. W.	3	Cloudy		
10	9 a. m	29	4	9	9	2	3	S. W.	3	Cloudy	0,	402
	4 p.m	29	5	10	6	2	0	W.	2	Fair		
11	9 a. m	28	9	9	6	2	3	W.	3	Cloudy	0,	145
	5 p.m	29	2	9	7	2	2	W.	3	Cloudy		
12	9 a. m.	29	4	9	1	2	2	W.	2	Clear		
	5 p.m.	29	6	10	0	1	8	W.	2	Cloudy		
13	9 a. m.	30	1	8	9	2	0	S. W.	1	Cloudy	0,	088
	5 p.m	30	2	10	1	1	8	S. b W.	2	Cloudy		
14	8 a. m.	29	9	10	7	2	2	S. W.	3	Cloudy		
	2 p.m.	29	8	12	0	2	0	S. W.	3	Cloudy		
15	9 a. m.	29	8	10	6	2	6	W.	2	Clear	0,	209
	2 p.m.	29	8	11	8	2	3	W.	2	Cloudy		
16	9 a. m.	29	6	11	6	2	0	W.	2	Fair	-	-
	2 p.m.	29	6	11	3	1	8	W.	3	Fair		

1, 761

D.	Hour.	Baro. In.	Baro. D.	Ther. In.	Ther. D.	Hyg. I.	Hyg. D.	Wind. Dir.	Wind. For.	Weather	Rain. 1,761
17	8 a. m.	29	8	9	8	2	4	W.	2	Fair	- -
	5 p. m.	29	9	11	2	2	0	W.	3	Cloudy	
18											
	2 p. m.	29	8	12	8	2	1	S. W.	2	Fair	
19	9 a. m.	29	8	11	6	2	2	S. W.	1	Fair	
20											
	1 p. m.	29	5	11	7	1	7	S. W.	3	Fair	
21	9 a. m.	29	1	11	3	1	9	S. W.	3	Cloudy	
	2 p. m.	29	1	10	8	1	5	S. W.	3	Cloudy	
22	8 a. m.	29	3	9	2	2	1	W.	2	Clear	0,315
	5 p. m.	29	4	9	4	1	9	W.	2	Clear	
23											
	2 p. m.	29	5	9	9	1	7	W.	2	Clear	
24											
	2 p. m.	29	6	10	8	1	5	S.	2	Clear	
25	10 a. m.	29	3	9	3	1	7	W.	3	Snow	0,194
	2 p. m.	29	3	9	4	1	5	W	3	Clear	
26	9 a. m.	29	3	9	4	2	0	S.	3	Rain	0,062
	3 p. m.	29	3	12	2	2	2	W.	3	Cloudy	
27	9 a. m.	29	5	11	5	1	8	S. W.	3	Cloudy	- -
	5 p. m.	29	4	12	0	2	0	S. W.	4	Rain	
28	9 a. m.	29	6	9	4	2	0	S. W.	3	Clear	0,077
	5 p. m.	29	7	10	2	1	7	W.	2	Clear	
29	9 a. m.	29	8	9	5	1	9	W.	2	Clear	
	5 p. m.	29	8	10	7	1	5	W.	1	Clear	
Ht. at a Med.		29	4	10	4	2	1			Total Depth	2,409
Great. Height		30	2	12	8	3					
Least Height		28	7	8	6	1	5				

D.	Hour.	Baro. In.	D.	Ther. In.	D.	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain. In.	D.
1	9 a. m.	29	4	10	8	1	8	S. W.	4	Tempeſt	0, 067	
	5 p. m.	29	4	10	2	2	6	W.	3	Rain		
2	8 a. m.	29	3	9	1	2	3	W.	3	Clear	0, 032	
	5 p. m.	29	3	9	3	1	8	W.	2	Clear		
3	9 a. m.	29	3	9	1	1	5	N. W.	4	Clear	0, 015	
	5 p. m.	30	1	9	4	1	4	N. W.	2	Clear		
4	9 a. m.	30	1	8	9	1	7	W.	2	Cloudy	- -	
	6 p. m.	29	9	10	9	1	9	W.	2	Cloudy		
5	9 a. m.	29	7	11	2	2	4	W.	2	Cloudy	- -	
	4 p. m.	29	6	11	7	2	4	W.	2	Cloudy		
6	9 a. m.	29	6	11	0	2	4	W.	1	Clear		
	4 p. m.	29	6	10	8	1	6	N. W.	2	Rain		
7	9 a. m.	29	8	9	8	1	9	N. W.	1	Clear	0, 021	
	5 p. m.	30	0	10	6	1	6	E.	1	Clear		
8	9 a. m.	29	9	10	0	1	9	E.	1	Fair	- -	
	5 p. m.	29	7	10	5	1	8	W. b. N.	2	Fair		
9	9 a. m.	29	5	10	1	1	8	W. b. N.	2	Fair	- -	
	4 p. m.	29	4	9	2	1	9	N.	2	Variable		
10	9 a. m.	29	4	7	7	1	5	N. W.	3	Snow		
	5 p. m.	29	4	7	8	1	4	N. W.	3	Clear		
11	9 a. m.	29	4	7	7	1	4	N. W.	3	Cloudy	0, 039	
	4 p. m.	29	4	7	8	1	4	N.	2	Clear		
12	9 a. m.	29	4	7	6	1	3	W.	2	Clear		
	6 p. m.	29	4	8	8	1	2	S. W.	2	Cloudy		
13	9 a. m.	29	2	9	4	2	2	W.	2	Cloudy		
	4 p. m.	29	3	9	5	1	5	N. E.	1	Clear		
14	9 a. m.	29	3	9	8	2	7	S. W.	2	Cloudy	0, 102	
	5 p. m.	29	2	10	7	1	7	S. W.	1	Cloudy		
15	9 a. m.	29	2	10	1	2	1	S. W.	1	Fog		
	5 p. m.	29	3	11	0	1	8	N.	1	Clear		
16	9 a. m.	29	6	10	6	2	2	E.	1	Fog		
	5 p. m.	29	6	10	5	2	1	E.	1	Rain		
											0, 276	

D.	Hour.	Baro. In.	D.	Ther. In.	D.	Hyg. I.	D	Wind. Dir.	For.	Weather	Rain.
											0, 276
17	9 a. m.	29	6	10	4	2	2	E.	1	Cloudy	0, 024
	4 p. m.	29	7	11	7	2	4	S. W.	1	Cloudy	
18	9 a. m.	29	6	11	4	2	0	S. W.	1	Rain	0, 056
19	9 a. m.	29	6	12	5	2	3	W.	2	Cloudy	
	5 p. m.	29	7	13	4	1	8	W.	1	Cloudy	
20	9 a. m.	29	8	12	9	2	0	W.	1	Clear	
	5 p. m.	29	8	13	6	1	8	W.	1	Cloudy	
21	9 a. m.	29	8	12	3	2	3	W.	1	Fog	0, 015
	3 p. m.	29	8	13	6	2	0	W.	1	Cloudy	
22	9 a. m.	29	9	12	1	2	2	W.	2	Clear	
	5 p. m.	29	9	12	6	1	6	W.	2	Cloudy	
23	9 a. m.	29	9	12	4	1	7	S. W.	2	Cloudy	
	4 p. m.	29	9	13	4	1	4	W.	2	Cloudy	
24	10 a. m.	29	9	13	0	1	7	W.	2	Cloudy	0, 031
	5 p. m.	29	9	13	0	1	7	W.	2	Fair	
25	9 a. m.	29	9	10	7	1	5	W.	3	Fair	
	5 p. m.	29	8	10	5	1	2	N. W.	3	Fair	
26	9 a. m.	29	7	9	5	1	5	N. W.	3	Cloudy	0, 050
	5 p. m.	29	7	10	1	1	3	N. W.	3	Hail	
27	9 a. m	29	6	9	0	1	5	N. W.	2	Fair	0, 030
	4 p. m.	29	6	9	0	1	8	N.	1	Snow	
28	9 a. m.	29	6	9	4	1	8	E.	1	Snow	
	5 p. m.	29	5	9	7	1	4	E.	1	Fair	
29	9 a. m.	29	5	9	4	1	7	E.	2	Fair	0, 138
	6 p. m	29	5	9	5	1	4	E.	1	Fair	
30	9 a. m.	29	6	9	7	1	5	E.	2	Cloudy	
	4 p. m.	29	5	9	7	1	5	E.	3	Cloudy	
31	9 a. m.	29	5	9	9	3	0	E.	2	Rain	0, 173
	4. p. m.	29	5	9	9	3	4	E.	2	Rain	
Ht. at a Med.		29	6	10	4	1	8			Total Depth	0, 793
Great. Height		30	1	13	6	3	4				
Leaſt Height		29	2	7	6	1	2				

D.	Hour.	Baro. In.	D.	Ther. In.	D	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain. In.	D.
1	9 a. m	29	5	9	8	3	4	E.	2	Fog	0,	193
	5 p. m.	29	5	9	9	3	3	E.	2	Fog		
2	9 a. m.	29	6	10	3	3	4	E.	2	Fog	0,	095
	5 p. m.	29	6	10	9	2	4	E.	1	Fog		
3	9 a. m.	29	6	10	9	2	7	S. E.	1	Cloudy	0,	070
	5 p. m.	29	5	12	7	2	0	S.	1	Cloudy		
4	9 a. m	29	3	11	9	2	3	S.	1	Rain		
	6 p. m.	29	3	12	4	1	9	S. W.	2	Fair		
5	9 a. m.	29	4	11	7	1	9	S. W.	2	Fair	0,	082
	5 p. m.	29	5	13	2	1	6	S. W.	1	Fair		
6	9 a. m.	29	7	10	6	3	0	E.	2	Mist.		
	5 p. m.	29	7	10	9	2	9	E.	2	Mist		
7	9 a. m.	29	7	10	2	3	6	E.	2	Mist		
	5 p. m.	29	7	10	8	3	5	E.	2	Mist		
8	9 a. m	29	7	10	5	3	8	E.	2	Mist	0,	097
	5 p. m.	29	7	11	6	2	9	E.	2	Mist		
9	8 a. m	29	8	10	6	3	6	E.	2	Mist		
	5 p. m	29	9	10	8	3	3	E.	2	Mist		
10	9 a. m.	30	0	10	4	3	3	E. b. N.	2	Hazy		
	6 p. m.	30	0	11	0	2	5	E.	2	Hazy		
11	9 a. m	29	9	10	5	2	5	N. E.	3	Variable	0,	030
	5 p. m.	29	8	10	9	2	2	N. E.	2	Fair		
12	8 a. m.	29	6	10	6	2	5	S. W.	2	Clear		
	5 p. m.	29	5	11	9	1	8	N. E.	2	Cloudy		
13	9 a. m.	29	6	9	3	1	6	N. W.	3	Cloudy	0,	350
	7 p. m.	29	6	9	5	1	5	N. W.	3	Snow		
14	9 a. m.	29	5	9	1	1	4	N. W.	3	Cloudy		
	7 p. m.	29	5	9	6	1	4	N. W.	3	Cloudy		
15	9 a. m.	29	5	9	9	1	3	N. W.	3	Clear	0,	105
	4 p. m.	29	5	10	9	1	2	N. W.	2	Cloudy		
16	8 a. m.	29	5	9	0	1	3	N. W.	2	Clear		
	5 p. m.	29	6	10	7	1	1	N. b. W.	2	Cloudy		
											1,	022

D	Hour.	Baro. In.	D.	Ther. In.	D	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain.
											1,022
17	9 a.m	29	7	10	2	1	3	N. b. E.	2	Clear	
	5 p.m.	29	7	11	3	1	2	N. W.	1	Clear	
18	9 a.m.	29	7	10	8	1	3	N. W.	1	Clear	0,131
	5 p.m	29	7	11	8	1	4	S. E.	2	Cloudy	
19	8 a.m	29	7	10	6	1	5	S. E.	2	Rain	
	5 p.m	29	7	10	1	1	9	E.	2	Rain	
20	9 a.m	29	7	10	5	2	4	E.	2	Cloudy	0,119
	5 p.m	29	6	10	8	2	0	E.	1	Cloudy	
21	9 a.m	29	6	11	8	2	7	E.	1	Fog	0,152
	5 p.m	29	6	12	4	2	4	E.	1	Rain	
22	9 a.m	29	5	12	4	2	3	W.	1	Cloudy	0,209
	6 p.m	29	5	12	5	2	2	S. W.	1	Rain	
23	9 a.m	29	5	11	4	2	9	S. E.	1	Rain	
	7 p.m.	29	2	11	8	2	5	S. E.	1	Rain	
24	9 a.m.	29	1	12	4	2	1	S.	1	Cloudy	0,568
	5 p.m.	29	2	13	4	1	6	S. b. W.	2	Clear	
25	9 a.m.	29	3	12	7	2	1	S.	2	Rain	0,154
	4 p.m.	29	4	13	0	1	8	E.	2	Rain	
26	9 a.m.	29	7	10	2	2	3	E.	2	Clear	0,074
	6 p.m.	29	7	11	2	1	7	E.	2	Clear	
27	9 a.m.	29	8	10	6	1	7	N. E.	2	Clear	- -
	5 p.m.	29	8	12	5	1	4	N. E.	1	Cloudy	
28	9 a.m.	29	7	12	0	1	6	W.	2	Cloudy	0,058
	4 p.m	29	6	10	0	1	6	N. W.	2	Rain	
29	9 a.m.	29	6	11	2	2	0	N. E.	2	Cloudy	0,262
	7 p.m.	29	6	10	0	2	2	N. W.	3	Hail	
30	9a.m.	29	6	9	8	1	5	W.b. N.	3	Cloudy	0,357
	5 p.m.	29	5	10	7	1	6	W.b.N.	3	Rain	
H. at a Med.		29	5	10	8	2	1			Total Depth	3,106
Great. Height		30		13	2	3	8				
Least Height		29	1	9		1	1				

D.	Hour.	Baro. In.	D.	Ther In.	D.	Hyg. I.	D.	Wind. Dir.	For.	Weather	Rain. In.	D.
1	8 a. m.	29	5	9	5	2	5	S. E.	2	Cloudy	0,	327
	5 p. m.	29	4	9	1	2	5	N. E.	2	Rain		
2	9 a. m.	29	5	9	3	1	6	W.	2	Clear	0,	255
	5 p. m.	29	5	10	7	1	3	W. b. N.	2	Clear		
3	9 a. m.	29	6	9	8	1	4	W. b. N.	2	Clear	0,	093
	5 p. m.	29	6	11	6	1	1	W. b. N.	2	Clear		
4	9 a. m	29	6	10	6	1	5	N. W.	2	Clear		
	4 p. m.	29	6	10	8	1	4	N. W.	2	Clear		
5	9 a. m.	29	6	10	1	1	4	N. b. E.	2	Cloudy		
	5 p. m.	29	6	11	8	1	1	N.	2	Clear		
6	8 a. m.	29	8	11	1	1	3	N.	2	Clear		
	4 p. m	29	8	12	0	1	0	N. E.	2	Clear		
7	9 a. m.	29	9	11	9	1	1	S. E.	2	Clear		
	4 p. m	29	8	13	5	1	0	S. E.	2	Clear		
8	8 a. m.	29	6	11	8	1	6	E.	2	Cloudy		
	5 p. m	29	5	12	9	1	7	S.	2	Rain		
9	9 a. m	29	6	12	6	1	5	S. W.	2	Cloudy	0,	099
	5 p. m.	29	5	12	8	1	5	S. E.	2	Rain		
10	8 a. m.	29	4	12	7	1	6	S.	2	Cloudy		
	8 p. m	29	4	12	6	1	5	S.	2	Rain		
11	9 a. m	29	3	12	4	1	5	S. W.	3	Cloudy	0,	173
	5 p. m.	29	3	13	9	1	0	S. W.	3	Clear		
12	8 a. m.	29	2	12	7	1	5	W.	3	Clear	0,	237
	5 p. m.	29	3	12	5	1	5	W.	3	Rain		
13	8 a. m.	29	5	12	2	1	4	W.	2	Cloudy	0,	192
	5 p. m.	29	5	12	7	1	5	S.	2	Rain		
14	9 a. m.	29	4	13	7	2	0	S. W.	2	Cloudy	0,	125
	6 p. m.	29	4	13	5	1	5	S. W.	3	Cloudy		
15	8 a. m.	29	5	13	5	1	6	S. W.	2	Cloudy	0,	157
	8 p. m.	29	5	13	4	1	4	S.	3	Cloudy		
16	8 a. m.	29	5	13	2	1	4	S. W.	2	Cloudy		
	5 p. m.	29	6	14	3	1	3	N. E.	2	Cloudy		

1, 658

D.	Hour.	Baro. In. D	Ther. In. D	Hyg. I. D	Wind. Dir. For.	Weather	Rain.
							1,658
17	8 a. m.	29 9	10 0	1 2	E. b. N. 3	Rain	0,298
	5 p. m.	29 9	11 3	1 5	E. 2	Cloudy	
18	8 a. m.	29 9	10 9	1 7	N. W. 2	Cloudy	0,064
	4 p. m	29 9	11 1	1 5	N. W. 2	Clear	
19	8 a. m.	29 8	10 5	1 3	N. W. 2	Cloudy	0,313
	4 p. m	29 7	11 1	1 3	N. W. 2	Hail	
20	8 a. m	29 6	10 5	1 5	N. 1	Cloudy	0,279
	4 p. m.	29 7	11 8	1 5	E. 1	Cloudy	
21	8 a. m	29 7	11 5	1 4	S. 1	Clear	
	4 p. m	29 7	13 1	1 4	S. E. 1	Cloudy	
22	8 a. m	29 7	12 2	2 2	W. 2	Rain	0,411
	4 p. m.	29 7	13 0	2 1	W. b. N. 2	Rain	
23	8 a. m	29 5	11 9	2 5	E. b. S. 1	Cloudy	0,195
	4 p. m	29 4	12 8	2 0	E. b. S. 2	Cloudy	
24	9 a. m	29 4	12 5	2 5	S. 2	Rain	0,177
	4 p. m.	29 4	12 9	2 2	E. 2	Rain	
25	9 a. m.	29 4	11 9	2 9	E. b. S. 2	Cloudy	0,305
	4 p. m.	29 4	12 6	2 0	E. 1	Cloudy	
26	8 a. m.	29 5	11 8	2 5	E. 1	Cloudy	0,392
	4 p. m.	29 4	12 8	1 9	E. 2	Cloudy	
27	9 a. m.	29 1	12 5	3 0	E. 2	Cloudy	0,185
	7 p. m.	29 0	13 7	1 8	E. 1	Cloudy	
28	8 a. m.	29 0	13 2	1 9	S. 2	Cloudy	0,140
	4 p. m.	29 1	14 0	1 5	S. 2	Cloudy	
29	8 a. m.	29 2	13 5	1 7	S. 2	Clear	0,061
	4 p. m	29 3	14 5	1 3	S. 2	Clear	
30	9 a. m.	29 5	13 4	1 8	S. W. 2	Rain	0,094
	5 p. m.	29 5	14 6	1 7	S. W. 2	Cloudy	
31	8 a. m.	29 5	12 6	2 0	S. E. 2	Cloudy	0,055
	5 p. m	29 5	14 6	1 3	W. 2	Clear	
Ht. at a Med.		29 5	12 2	1 6		Total Depth	4,627
Great Height		29 9	14 6	3 0			
Least Height		29	9 1	1 0			

IV. *An Account of the* DISEASES *that were moſt frequent laſt Year in* EDINBURGH.

HAVING undertaken to give ſome Account yearly of the Diſeaſes that ſhall be obſerved moſt frequent in this City and neighbouring Places, and of their Changes and Succeſſions, we judged it moſt proper to begin our Obſervations at ſome intermediate Period betwixt the two grand Claſſes of epidemical Diſtempers, according to the ſagacious *Sydenham*, the *Vernal* and *Autumnal*. Our medical Year therefore ſhall commence at the Summer Solſtice, when the Spring Diſeaſes are generally worn out, and before the Declenſion of the Sun has brought on the Product of the Autumn.

In the Year 1731, in the Month of JUNE, many were ſeized with a Swelling on the Face, and Salivary Glands, which was not attended with a Fever or Redneſs of the Skin, and was eaſily removed by a gentle Purgative or two.

In the ſucceeding Months of JULY and AUGUST, this Swelling turned more upon the

Erysipelas Kind, and fell chiefly upon the Forehead and Eye-lids; the Skin, however, was not very high coloured, nor the Fever violent: This was likewise carried off by purging and Vesicatories. Near of kin to this were the *Ophthalmia*, Tooth-ach, Pains in the Head, and a slight Rheumatism, all which were pretty frequent about the same Time, but none of them were accompanied with so acute a Fever, or such violent Symptoms as required large Evacuations; for generally once bleeding relieved the Patients, and a few Doses of Catharticks completed the Cure.

Towards the End of *July* some Agues began to appear; but these had nothing singular, and yielded easily to the usual Treatment.

The Crystal or Bastard Small-pox broke out among the Children in *August*, sometimes preceeded by the feverish Symptoms, but for the most Part these were very gentle, and the Eruption easy. Some Children, when the first Pustules were well advanced, or going off, had a second Eruption of fresh Pustules, and some a third: But still this Sort of Small-Pox was very kindly, and without Danger, requiring little more than a cooling Regimen, or low Diet. At the same Time several Persons were taken

ken with a gentle *Cholera*, which generally wrought itſelf off in two or three Days, without great Uneaſineſs, or was cured by ſome Doſes of Rhubarb. To this ſucceeded *Dyſenteries*, which often proved very tedious, tho' rarely mortal. The moſt ſucceſsful Method was to give repeated Doſes of the Ipecacuanha, Purges of Rhubarb with Calomel, which often had the Effect of an Emetic, and an Opiat every Evening. Other aſtringent Medicines, without theſe gentle Revulſions and Evacuations frequently repeated, were not ſo effectual in this Diſeaſe, for they generally retarded the Cure.

In OCTOBER a *Pleuriſy*, with its uſual Symptoms, became frequent; but at this Time the Pain was moſtly external, and increaſed by touching the Part, or lying upon the Side affected: The Violence and Continuance of the Pain, the Hardneſs and Frequency of the Pulſe, required plentiful and frequent Bleeding; however the Pain was not wholly removed thereby, but afterwards the Application of Veſicatories, eſpecially on the Side affected, afforded great Relief. This Diſeaſe at length degenerated to a *Pleuritick* Fever, which laſted moſt Part of the Winter and Spring. In this Fever the Pain was not ſo conſtant or acute as

in the Pleuriſy, but the Breathing was more difficult, and the Pulſe more diſorderly, and often low. In the Beginning, this Diſeaſe was pretty obſtinate, but not ſo mortal as it proved afterwards in the Spring, of which more herafter.

In NOVEMBER a ſlow Fever prevailed pretty much in Town, but much more in ſome neighbouring Villages. It was attended with a violent Pain of the Head, a ſmall but quick Pulſe, Ravings and Watchfulneſs; ſeveral in an advanced Age died of it; but of the younger Sort, many paſſed Worms by Stool and recovered. This Fever abated ſomewhat in JANUARY, but in the next Month it became more frequent and hazardous than before; the Headach was more violent, the Ravings more conſtant, and the Watchfulneſs more obſtinate; to theſe bad Symptoms were added tremulous Motions, and ſtartings of the Tendons, and ſometimes ſymptomatick Bleedings at the Noſe without Relief: In moſt Patients the Pulſe was little and frequent; in ſome, not much changed from the natural; and in others, the Arteries ſeemed full, but contracted weakly; the Urine was generally pale, and without Sediment. Theſe Fevers, when allowed their Courſe ſome Days without Interruption, were moſt obſtinate to Reme-

dies

dies, and carried off ſeveral vigorous young Men; but in the firſt Days, bleeding and vomiting, and afterwards bliſtering did good Service, and prevented or abated ſome of the worſt Symptoms.

In the Interval of this Fever, that is, in *December* and *January*, there was another frequent among the common People, which always began with a *Diarrhæa*; if this was neglected in the Beginning, it never failed to ſink the Pulſe, and bring on a *Delirium* and Watchings, which could not be removed by bliſtering, diaphoretick or opiate Medicines, but continued obſtinate till the Tenth or Twelfth Day when theſe Patients died: But when they were early bled and vomited, then Opiates had remarkable Succeſs, and the Patients were well on the fifth or ſixth Day. At the ſame Time other People had a *Diarrhæa*, without any Fever; but this was eaſily carried off by the common Method of vomiting and purging.

A *Quinſy* likewiſe was pretty frequent at this Time; it was in moſt People inflammatory, and attended with a ſharp Fever, and was cured by plentiful bleeding in the Beginning, and bliſtering; ſometimes alſo it went off by natural and plentiful Sweating after letting Blood.

The

The *Pleurisy* formerly mentioned, began in MARCH to rage with greater Violence than before, and continued through the two following Months. The Inflammation seem'd to have its Seat for most part in the Muscles; for the Patients during the whole Disease could never bear to ly on the affected Side; but a thick, difficult and painful Breathing, a Heat and Oppression in the Breast from the Beginning, gave good Reason to suspect that a Peripneumony was joined to it. Perhaps also in some Cases the OEsophagus or Stomach was slightly inflamed; for many who laboured under this Disease, had a frequent and strong reaching to vomit, and even bore the Operation of a gentle Emetic more easily than these Throws. The Pulse was generally quick and low, but very changeable, and sometimes intermitting; the Urine in small Quantity, and of a pale Colour; the Thirst great, and the Tongue foul and parcht. Upon the first Bleeding the Pain was somewhat allay'd; the Pulse grew fuller and stronger, and the Breathing easier; but the Return of the former Complaints soon required a second, and then a third Bleeding, which however often sunk the Pulse so much, that it was difficult afterwards to raise it to a moderate Strength, unless Vesicatories

ſicatories were inſtantly applied, which frequently were of great Uſe, and ſometimes brought on a Sweat. If this was free and plentiful, it carried off the Diſeaſe, but if partial and ſhort, the Patients ſtruggled on with Pain, Inquietude and Agony, till their Strength was quite ſpent.

About this Seaſon Children were attacked with ſeveral Diſeaſes, but none of them proved dangerous. Coughs were very univerſal among Children, eſpecially when the Eaſt Wind blew, or upon the Fall of Snow; and indeed through all this Winter and Spring, Perſons of all Ages have been more ſubject to Coughs than uſual. The Chincough likewiſe, that had been violent among the Children at ſome Diſtance from Town, ſince the Beginning of the Year, now advanced to the Suburbs, but was very little felt within the City, as it happens at moſt other Times, however frequent it may be in the Country about. Many Children at this Time got a Swelling on the Face, neither œdematous, nor very inflammatory, and therefore may be called *Eryſipelas Oedematodes*. Beſides Children, others likewiſe had this Swelling which often ſpread it ſelf over the Head, and ſometimes ſeized the Arms and lower Extremities, where it created a painful itch-

ing.

ing. Emollient Fomentations gave Eaſe; and the Swelling was carried off by gentle purging. About the End of *March* a ſhort but ſmart Fever ſeized ſeveral Children, without any topical Inflammation: This needed no other Cure than a cooling Ptiſan, or at moſt once Bleeding. Some grown Perſons at this Time felt Attacks of the *Rheumatiſm* and *Lumbago Rheumatica*, which were eaſed by bleeding, bliſtering, and warm Applications.

In the following Months, APRIL and MAY, ſcarce any new Diſeaſe appeared, but the Remains of thoſe already mentioned were ſtill to be found, *viz.* The Pleuriſy, the ſlow Fever, with a Head-ach, and ſome with a *Diarrhœa*, the *Eryſipelas Oedematodes*, the common Cough, Chin-cough, and *Ophthalmia*; only Tertian Agues were now epidemic.

V. *An Extract from the publick* Regiſter *of* Burials *in* Edinburgh.

1731.	Men.	Women.	Child	Still-born.	Sum.
June - -	17	27	35	5	84
July - -	19	32	33	5	89
Auguſt -	26	26	27	2	81
September	17	30	38	3	88
October -	12	19	23	1	55
November	20	27	38	1	86
December	28	23	40	3	94
1732.					
January -	36	26	25	3	90
February -	35	32	38	3	108
March -	23	31	46	4	104
April - -	29	26	58	3	116
May - -	34	34	51	5	124
Total	296	333	452	38	1119

N. B. The above Extract is only taken from the Records of the City and *Canongate*, the numerous Suburbs being of Deſign omitted, becauſe of the Danger of confounding their Burials with thoſe of the Country (Landward) Part of the Pariſhes to which they belong, which there is not ſufficient Care taken to diſtinguiſh in the Regiſters. And for the ſame Reaſon theſe Suburbs are very ſlightly mentioned in the Deſcription of *Edinburgh*, and no Regard is had to them in the Calcul of the Number of the Inhabitants of this City.

VI. *An*

VI. *An Alterative Mercurial Medicine, by* ANDREW PLUMMER, M. D. *Fellow of the College of Physicians, and Professor of Medicine in the University of* Edinburgh. *vid. Vol. 3. p. 389.*

ALTHO' I am fully satisfied that 'tis impossible, with any Certainty, to attain to the Knowledge of the Virtues or Effects of a new and unknown Medicine upon the humane Body, by reasoning *à priori*; yet I cannot think it inconsistent with this Principle, to affirm, That certain Conclusions or at least very probable Conjectures may be deduced from the known Operations of some Medicines, concerning the Virtues and Effects of others tho' untried, when prepared and compounded of such whose Powers we have already learned by repeated Experiences and constant Observations: Especially, if we are sufficiently informed by chemical Experiments, of the Effects of the Bodies employed in the Preparation, when applied to one another and treated in a certain Manner. Upon this Foot alone it is, that any new Production of Chemistry can first be introduced

duced into Practice among Physicians; and this way of Reasoning first induced me to make Trial of a Medicine compounded of *Sulphur auratum Antimonii* and *Calomelas*, with some reasonable Hopes of Success in some Cases which I am to relate, after I have said somewhat of the Medicine itself, its Preparation and Use.

After that some simple Preparations of *Antimony* and *Mercury* had recommended themselves to the Observation of Physicians by their great and surprising Effects in many obstinate Distempers, the Chemists every where employed all their Art to change these two Herculean Medicines into various Shapes; but as many of their Preparations were found too rough and untractable, they set to work again to refine, subtilize, tame and correct them, by repeated Operations, and the Addition of various Bodies: But their utmost Skill was employed, and their greatest Hopes were built upon the uniting and incorporating *Antimony* and *Mercury* together, separating what they imagined the most noxious or useless Parts of these Bodies, and combining their most active Principles. To these Labours of the Chemists we owe the *Butyrum* and *Cinnabaris Antimonii*, *Mercurius Vitæ*, *Bezoardicum Minerale*, *Bezoar-*

zoardicum Solare, Lunare, Joviale, several *Panacæas* and many other Preparations, on which the Inventers have bestowed the most exorbitant Encomiums; but I am afraid the too officious Care of the Chemists has rendred many of these Preparations altogether unactive, while others remain incorrigible and unfit for what they were intended.

The Medicine which I here offer to Consideration, after I have had some Experience of its Effects, does not come recommended by a pompous Title, or by a tedious and perplexed Process; but I hope its Simplicity will not prejudice any ingenious Person against it: The *Sulphur auratum Antimonii* and *Calomelas*, of which this Medicine is compounded, are so well known to every body employed in Physick, that I need not here mention their Preparation or Uses; only I must take notice, that I prefer *Angelus Sala*'s Method of preparing the *Sulphur Antimonii*, to that which is directed in most *Pharmacopœias* and Courses of Chemistry. *Sala* (*a*) proceeds in this Manner: Reduce *Antimony* to a gross Powder, or rather break it in small Pieces like Grains of Barley; Separate the finer Dust

(*a*) Anat. Antim. Part. 2. § 1. cap. 2. p. m. 225

Duſt by a Searce, and put the ſmall Pieces into a flat-bottom'd Glaſs, pouring in *Aqua Regia* till it riſes a Finger's Breadth above the *Antimony*; Let the Solution go on without Heat, and when there appears a ſulphurous or pitchy Matter ſwiming on the Liquor, and the *Antimony* is covered with a yellowiſh Cruſt, gently pour the *Aq. Reg.* into another Veſſel, keeping back the ſulphurous Matter, and waſh the remaining *Antimony* ſeveral times with freſh Water, till it acquires no Acidity; Then pour upon the *Antimony Ol. Tart. p. d.* to the Height of two Fingers; Place the Veſſel in warm Sand, and increaſe the Fire till the Liquor boils; Pour out this Tincture, and add new *Ol. Tart.* proceeding as before: To theſe Tinctures or Solutions while warm, add diſtilled Vinegar till the Effervescence ceaſes; Place the Veſſel again on warm Sand, and a Powder will fall to the Bottom, which ſeparate by a Filtre, and dry upon brown Paper. This Sulphur, or rather *Lac Sulphuris Antimonii*, *Tachenius* (*a*) imagines is the ſame that *Helmont* (*b*) hints at in ſome obſcure Expreſſions, where he ſays, the true Sulphur of Antimony very much reſembles common Sulphur, only

(*a*) Hipp. Chem. p. 198. (*b*) In verb. Herb. &c. p. 354. 460.

its Colour has more of a greenish Cast; with this Sulphur he prepares a *Cinnabar*, which, when six times sublimed and infused in Wine, produces most surprising Effects: And this *Cinnabar* seems to be the same with the *Mercurius diaphoreticus* which he mentions in the same Treatise. *Tachenius* also affirms, that he found by Experience this Sulphur to be an admirable Remedy in the *Tympany*: Of the same he prepares a Liniment, with two Simples not named, which rubbed upon the Spine, Wrists, and Soles of the Feet, infallibly cures Tertian Agues. *Sala* likewise reckons this Sulphur a powerful Aperient, Discutient and Sudorific.

I said before, that I preferred the *Sulphur Antimonii* prepared in the Manner now described, to the *Sulphur auratum* of the Shops; not only upon the Authorities just mentioned, but also, because in the common Preparation, while the *Antimony* deflagrates with *Nitre* and *Tartar*, much of the true *Sulphur* is consumed, and the Powder, which is precipitated from the Solution of the *Scoriæ*, consists of many of the gross earthy Parts of the Salts and Antimony: But I must own at the same time, that I have not sufficient Experience of *Helmont*'s Sulphur, for what I have hither-

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to used in the Composition of the Medicine of which I am treating was prepared in the common Way.

As for the Proportions of the *Sulphur auratum* and *Calomel*, when I first used this Medicine, knowing that my Patient was apt to salivate with a small Quantity of *Mercurius dulcis*, I used *Sulph. aurat. Antimon. p.* iii. *Calomel, p.* ii. but afterwards I took equal Parts of both, and increased or diminished the Dose as I thought proper. In the Composition, I think it is not sufficient simply to mix prepared *Calomel* with the *Sulphur auratum*; but in my Opinion it is better to unite them more intimately, by breaking the *Calomel* to a coarse Powder, and adding by Degrees the *Sulph. aurat.* to levigate them well upon a Marble, by which the bright red Colour of the *Sulph. aurat.* is changed to a dusky brown. I have always used *Calomel* in this Preparation, that is, *Mercurius dulcis* six times sublimed (besides the Sublimation of the *Corrosive Mercury* with Quick-silver) as more mild, and less apt to stimulate the Guts, or dispose the Humours to a Salivation. What concerns the Dose, Regimen to be observed, and Effects of this Medicine, these may be easily gathered from the following Histories.

Some Years ago a Lady about thirty, of a ſlender Make and fine Skin, being troubled with a *Porrigo Capitis* with hard and dry Cruſts, eſpecially on the Temples, asked my Advice for removing the Diſtemper. After ſeveral Doſes of purgative Medicines with *Calomel*, repeated at proper Intervals, I put her upon a Courſe of antiſcorbutick Medicines, and preſcribed ſome Applications as Lotions and Liniments to the Parts: By the Uſe of theſe for ſome Weeks, Part of the Scurf began to ſeparate; but my Patient too ſoon leaving off the Uſe of the Medicines, the Diſeaſe increaſed apace. When I was called again, about four Months from the firſt time, I found the ſcabby Cruſts had ſpread themſelves all over the Scalp, and reached down the Forehead to the Eye-brows and Noſe, and along the Sides of the Face to the Ears. Upon the Head, theſe Cruſts were not every where continued, but in large, thick and hard Spots, adhering very firmly to the Skin; when rubbed or ſcratched, they threw off branny Scales, but never ouzed out any Matter: Upon the Face, the Scurf was thin and white, the Skin under it was thicker, and in the Interſtices of the Scales appeared redder than uſual. There were no ſcaly Spots on other Parts of the Skin, nor any

any Complaints of Sickneſs or Pain, only an Itching of the Parts affected: The Diſeaſe at this time had the Appearance of the *Pſora* or beginning *Lepra*. In this Caſe I judged it neceſſary to put my Patient under a Courſe of *Mercury*; and indeed a ſmall Quantity of *Mercurius dulcis* in a few Days raiſed a Salivation which ſeemed to me ſufficient, and ſmall Doſes of the ſame repeated every ſecond or third Day for ſome Time, kept it up at the Rate of near three *Engliſh* Pints *per diem* for the Space of four Weeks. Upon the declining of the Flux, I ordered her Head to be fomented twice a Day with a Decoction of ſome of the more fixed kind of antiſcorbutick Plants, in which Soap was diſſolved, and the *Unguentum Antipſoricum cum Sulphure* to be rubbed upon it. By this Method and the Uſe of the Fleſh-bruſh the Cruſts fell quickly off; and after the Patient's Head had been ſhaved once or twice, the Skin appeared perfectly clean and ſound, and the Hair began to grow as thick and ſtrong as before. Thus the Diſeaſe ſeemed to be intirely carried off in the Beginning of Winter; but very early in the Spring the Scurf began to appear again upon the Temples, and very ſoon to ſpread itſelf over the Head and towards the Face. This

quick Return of the Distemper after a Salivation, and some Circumstances in the Lady's Situation at that Time made me bethink my self of some other Method of Cure. After casting my Thoughts upon several Things, especially among the antimonial and mercurial Medicines, I determined to make a Trial of the *Sulphur auratum Antimonii*; but not having any Experience my self of the Effects of this Medicine, and suspecting its Operation might be chiefly on the Stomach, I thought its emetic Quality might be corrected, partly by making the Dose less than is prescribed by Authors, and partly by adding to it a small Quantity of *Calomelas*, which would either determine its Operation downwards, or give it a Chance to pass into the Blood and penetrate the small Canals, without exciting a Salivation: But that I might have some Knowledge of the Effects of this Medicine before I prescribed it to my Patient, I resolved to try a Dose or two of it upon my self; I took therefore *Sulph. aurat. Antimon. p.* iii. *Calomel, p.* ii. and prepared them as above described: In a Morning fasting I swallowed down five Grains of this Powder with a little Conserve of Roses; this Dose did not affect me in any sensible Manner; next Morning I took 7 ½ Grains

Grains of the ſame, which did not affect me more than the firſt; therefore on the third Day I made the Doſe 10 Grains, which indeed gave me a Squeamiſhneſs and Puking for ſome Hours till Breakfaſt, and that Day I had a Stool more than uſual. By theſe Trials I was enabled to make a better Judgment of the Doſe and Operation of the Medicine I intended to preſcribe; I ordered therefore a Quantity of this Powder to be made into Pills with the *Extractum Gentianæ*, adding ſome Drops of the *Ol. Caryophyl.* and I divided the Maſs ſo, that 6 Pills ſhould contain 15 Grains of the Powder; of theſe the Patient was to take 3 in the Morning and 3 at Night, with a Draught of a weak Decoction of the *Lignum & Cortex Guaiaci* moderately warm, which ſhe was alſo to uſe for ordinary Drink; the Fomentation and Ointment formerly mentioned were renewed, only in Place of diſſolving Soap in the Fomentation, I cauſed *Sulphuris flavi contuſi Unc. ſem. Sal. Tart. Drach.* iii. to be boiled in 2 Pounds of the Decoction.

As my Patient at this Time was at ſuch a Diſtance from the Town that I could not viſit her daily, I gave particular Directions in caſe any Accident ſhould happen, and as often as I had Opportunity enquired care-

fully into the Effects of the Medicine and Progreſs of the Cure. I found the Pills gave her no Uneaſineſs, and had no Tendency to vomit or purge; and tho', as I obſerved before, ſhe was very eaſily moved to a Salivation by Mercury, yet this Medicine did not affect her Mouth; only about ten Days after ſhe began to uſe the Pills, going abroad in a clear froſty Day when a pretty ſharp Wind blew, ſhe got a ſlight Swelling on her Face and a clear thin Spitting; however by the Warmth of her Chamber and Bed, having taken the Pills as uſual, the Swelling and Spitting were gone by next Morning, having ſweated more plentifully than uſual that Night; for while ſhe uſed this Medicine ſhe generally found a gentle Moiſture on her Skin towards the Morning. In the mean time the Cruſts were falling off apace, inſomuch that in the Space of four Weeks or thereby they were intirely removed, and the Lady has now continued near two Years without any Appearance of the Return of the Diſeaſe.

I had another Inſtance of the good Effects of the ſame Medicine in another cutaneous Diſeaſe.

A Perſon aged about twenty four, had a conſiderable Foulneſs of the Face from many large red Spots and Pimples: As this Eruption

ruption happened ſuddenly upon taking Cold, Blooding, Bliſtering, frequent Purges, and a long Uſe of Tincture of Antimony were tried in the Beginning, but with little Advantage: Afterwards antiſcorbutic Juices, Gum Pills with Soap, medicated Whey and Goat-whey were uſed for a conſiderable Time with no better Succeſs; at length even a ſix Weeks Salivation failed of removing theſe obſtinate Blemiſhes. After ſo many unſucceſsful Attempts I at laſt made Trial of the Powder deſcribed in the preceeding Caſe, of which likewiſe this Patient took 15 Grains a-day at twice, and drunk plentifully of new made Whey thro' the Day. In the Space of two Months (in which too there were ſome Interruptions) the Face turned ſmooth and the Complexion clear by the Uſe of this Medicine, with the Aſſiſtance only of a gently drying and detergent Lotion towards the End. This Patient alſo bore the Medicine eaſily without Squeamiſhneſs or Grippings.

Tho' I have never depended upon this Medicine for the Cure of the Venereal Diſeaſe from the Beginning, yet I have found it in ſome Inſtances very ſerviceable in preventing this Infection from ſpreading where I had Cauſe to ſuſpect it was not intirely rooted out by preceeding Medicines, and

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in carrying off the Dregs of this Distemper; for many Patients in these Cases too soon weary of a close Confinement, and frequently break off a Course before their Physicians are satisfied of their being safe from the Infection.

A Gentleman who had been unskilfully treated in a *Gonorrhœa*, and had the Running too quickly dried up, several Months after, finding himself attacked with worse Symptoms of the Disease, without having Reason to suspect a new Infection, asked my Advice: At this time he had a large *Bubo* on each Groin, and a *Chancre* on the Prepuce, which being naturally large and somewhat Strait, was a little inflamed and swelled, and threatned a *Phymosis*; after general Evacuations and Topicks to discuss the Swelling on the Prepuce, I judged it necessary to raise a Salivation by *Mercurius dulcis*, which with proper Applications carried off the *Chancre*; but seeing no Appearance of the *Bubo's* discussing, Suppuratives were applied; and at length by Escharoticks we endeavoured to extirpate them: But before this was intirely compleated, the Patient being necessarily obliged to go about pressing Business and soon to make a Journey into the Country, suffered the Parts to cicatrize sooner than we intend-

intended; however to prevent as much as poſſible any bad Effects from the Cure not being finiſhed to my Satisfaction, I preſcribed the Medicine of which I am here treating in the following Manner.

℞ *Sulph. aurat. Antimon. Calomel. non pp. a Drach.* ii. *Calomelas in craſſum pulverem redactum lævigetur ſuper marmor, per vices addendo Sulph. Antimonii portionem, & diuturno tritu fiat pulvis ſubtilis. Dein.*

℞ *Pulver. præcedent. Unc, ſem.*
Gum. Guaiac. Drach. iii. *Reſin. Guaiac. Drach.* i.
Balſam. Capyvi q. s. ut fiat maſſa pilularis ex cujus ſingulis Drachmis formentur Pilulæ xii.

I directed my Patient to take 3 of theſe Pills every Morning and as many at Night, with a Draught of the Decoction of the Woods, and to drink of it likewiſe at other Times. In the Courſe of ſome Weeks the Remains of the *Bubos* were quite gone; altho', as my Patient afterwards owned to me, it was not poſſible for him in the Country to ſhun ſome little Irregularities, or to uſe the Decoction, but inſtead of it he uſually drunk Whey.

A Perſon who had a virulent *Gonorrhœa* and a ſmall *Bubo* on one Side became my Patient:

Patient: After the uſual Directions about Diet, Drink, *&c.* and the Uſe of a penetrating Fomentation, I began with ſome Doſes of *Mercurius dulcis*, which was purged off by a Doſe or two of the *Pilulæ Cocciæ*; thus alternately the Doſes of Mercury and Purgatives were repeated three or four times; in the Intervals, Coolers, Balſamicks, Detergents were uſed according to Circumſtances and Symptoms: By theſe the Quantity of the Matter was leſſened, and its Colour and Conſiſtence changed to the better; but ſtill there remained ſome Running, and the *Bubo*, tho' ſmall at firſt, was not much diminiſhed, therefore I ordered the Pills deſcribed in the preceeding Caſe, and a Decoction of the Woods, which in twenty Days or thereby anſwered my Expectation and compleated the Cure. This Patient keeping pretty cloſe at home, and living on a ſpare cooling Diet during the Uſe of the Pills and the Decoction ſweated plentifully.

To a Perſon troubled with a Gleet, which indeed was not very conſiderable of itſelf, but had laſted five or ſix Months after the Cure of a *Gonorrhea*, I gave the ſame Pills in the ſame Doſe as before, by which and the Uſe of Briſtol Water the Gleet was carried off in a Fortnight. This Patient did not

not ſweat univerſally, but found a more than ordinary Moiſture about the *Inguina* and *Pubis*, which ſmelt ſomewhat ranker than uſual.

Theſe are the principal Trials I have hitherto made of this Medicine, from which I may be allowed to conclude, That it is not only free from the rougher Effects of many Mercurial and Antimonial Preparations, but likewiſe effectual in removing Obſtructions formed in ſome of the remoteſt and narroweſt Canals of the Body; and in carrying off the Recrements of ſome obſtinate Diſtempers, by promoting inſenſible Perſpiration or Sweat, provided it be prudently managed and aſſiſted by a proper Regimen, and other Medicines adapted to the Circumſtances of the Patient and Diſeaſe. But I don't encline to venture too far in aſſigning the immediate Effects of this Medicine upon the Solids or Fluids of the Body, or in determining in what other Diſeaſes it may be uſeful.

I have not the Vanity, Gentlemen, to imagine that the Medicine which I have communicated to you deſerves to be called a Diſcovery, or that the Caſes which I have related are, of themſelves, worthy to be recorded in your Collection: Other Phyſicians, I doubt not, have uſed *Sulphur auratum*

ratum Antimonii, as an Alterative or Diaphoretick, and *Calomel* is frequently given in small Doses, with much the same Intention, which might probably have led others in their Practice to join these Medicines before me; but as I do not remember to have met with any Instances of it, I thought it not inconsistent with your Scheme, to lay before you the Effects which I have observed from the Use of this Medicine, being perswaded for my own Part, that it is of some Importance to Physicians to have the true and genuine Effects of any Medicine, however simple and common it may be, confirmed by certain Experiments; and that Observations of this kind may be as useful as those which relate only the *prodigia naturæ*.

VII. *An Account of the Virtues and Use of the Mineral Waters near* Moffat, *by Mr.* George Milligen *Surgeon at* Moffat.

THe Mineral Waters, commonly known by the Name of *Moffat-Waters*, arise from two Springs or Wells separated from one

one another by a ſmall Rock, which ly at the Diſtance of a long Mile Northward from the Village of *Moffat* in *Annandale*, and 36 Miles S. W. from *Edinburgh*. Theſe Springs are ſituated on the Declivity of a Hill, and on the Brow of a Precipice, with many high Mountains at ſome Diſtance, and almoſt on every Side of them; for though the Hill on whoſe Side they are ſituated is ſmall, and of an eaſy Aſcent, yet it is the ſecond from the Plain of a Range of Hills that riſe gradually above one another, and run North towards their Summit called *Hartfield*, one of the higheſt Hills in *Scotland*. The Soil on every Side of the Wells is thin, and the Hills rocky, only juſt below the Wells there is a ſmall Moſs, cauſed by the falling of Water from the Hill above it.

There is a large Vein two or three Foot thick, of a flinty Rock, like what the Miners call *Spar*, which runs in one Direction for ſeveral Miles, forms the Bottom and lower Sides of the Wells, croſſes obliquely the Rivulet at the Bottom of the Precipice, and aſcends the Hill on the oppoſite Side. The Stones dug out of this Vein are a white or grayiſh Spar, having poliſhed and ſhining Surfaces of regular Figures, interſperſed with many glittering Particles of

a golden Colour, which are very copious and large in ſome Places, eſpecially about the Bottom of the Wells. Several ſmall Veins of the ſame Nature are apparent in the Precipices on each Side of the Rivulet, and ſeveral ſmall Guſhes of Water of the mineral Kind proceed from them. The Rocks and Stones about the Top of the Wells, and in other Parts of the Hill and Precipice, differ not from common Stones, no more than the Waters of ſome ſmall Springs in the Neighbourhood do from common Water.

There are two medicinal Springs, as I have ſaid, very near one another; the higher Well lies with its Mouth S. E. 'Tis of an irregular ſquare Figure, and is about a Foot and a half deep. The lower Well is ſurrounded with naked Rocks; it forms a ſmall Arch of a Circle. Its Depth is four Foot and a Half, and the Mouth of it faces the Eaſt. By a moderate Computation the two Springs yield 40 Loads of Water in 24 Hours, each Load containing 64 or 68 *Scots* Pints. The Water of the higher Well is for the moſt Part uſed for Bathing, having a more ſulphurous and fœtid Smell than the other; and by reaſon of its Shallowneſs, and the Looſeneſs of the Earth about it, is not ſo capable of being kept clean

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and proper for drinking as the lower Well: But as this diſcharges more than ſufficient for that Uſe, it alſo ſupplies a great Part of the bathing Water.

I have no Words fully expreſſive of the Taſte of theſe Waters; moſt People who drink them reſemble it to ſomething ſulphureous, as Gun-powder, the Scourings of a foul Gun, a weak Solution of *Sal Polychreſtum* or *Hepar Sulphuris*. Some expreſs it by the Taſte of a rotten Egg; but none of theſe juſtly come up to the genuine Taſte of the mineral Water. The Smell of it indeed nearly reſembles that of a foul Gun newly diſcharged. The Colour of the Water is ſomewhat milky or blewiſh, and that of the upper Well is moſt ſo.

There are a great many legendary Stories that paſs current with the common People in theſe Parts, about the firſt Diſcovery of the medicinal Virtue of *Moffat-wells*. What is moſt generally believed, is, That theſe Waters were obſerved to be endowed with ſome remarkable Properties, as impregnated with ſome Mineral, by a Daughter of Biſhop *Whiteford*, who was married to a Gentleman of this County, and lived within two Miles of the Wells. This Lady, 'tis ſaid, had been for the Recovery of her Health, at ſome *Spaws* in *En-*

gland or Abroad, and finding ſome Reſemblance between theſe Waters in her Neighbourhood, and thoſe ſhe had uſed elſewhere, made Trial of them, firſt by drinking, and afterwards by bathing in them; and finding Advantage by both, ſhe recommended the Uſe of them to others. Whether ſhe was the firſt that had experienced their medicinal Virtue, I ſhall not determine; but we have good Reaſon to believe ſhe was among the firſt, in as much as ſhe employed Workmen to clear the Ground about the Springs, (their overflowing having made a ſmall Moraſs) gave Encouragement to the Poor, and Advice to others, to make Uſe of a Medicine which Nature had ſo bounteouſly offered to them. This Lady was married in the Year 1633, or the Year following; and 'tis probable ſhe was a Virgin when ſhe was at the *Engliſh* or foreign *Spaws* abovementioned, becauſe her Grandchildren know nothing of her having Recourſe to any after her Marriage; ſo that it may not be many Years under a hundred ſince theſe Waters were firſt uſed medicinally. Indeed the old People here carry the Uſe of the Wells in a medical Way much higher; but as there is no Certainty for their Traditions, I ſhall paſs them over. Certain it is, that theſe Wells have had a con-

conſiderable Reputation beyond the Memory of any now living.

The proper Seaſon for uſing theſe Waters, is between the middle of *April*, and latter End of *September*; but ſome whoſe Diſeaſes are more obſtinate, continue to uſe them during the whole Winter; for even then, if the Weather is fair, or the Rains but moderate, the Water is little or nothing inferior to its Strength in the Middle of Summer.

The Method of uſing the Water externally, is either by bathing the whole Body, or ſome particular diſeaſed Part. The ordinary Practice of bathing the whole Body, is twice, or at the moſt thrice a Week, in the Evening, when the Dinner may be ſuppoſed to be digeſted. The Time of continuing in the Bath, is from a Quarter of an Hour, to a whole Hour or more, according to the Age, Sex, or Conſtitution of the Perſon diſordered. The beſt Way is to begin with a few Minutes, and gradually to increaſe the Time of Continuance in the Bath, as the Patient finds it to agree with him. The Water uſed in bathing is not now made much warmer than tepid; and the Patients when they come out of it, rub and dry their Skins, and immediately put on their Clothes, without encoura-

ging Sweating. Whereas not many Years since, the Baths were made as hot as one could bear them; and the Patients, after coming out of the Water, sweated for a full Hour in Bed, wrapt up in Flannel or Blankets. I shall not say but this Method may in some Cases be very proper; but in my Opinion, the Practice now in use is the more rational, and is in some Measure warranted by its Success in most Cases.

The bathing of the whole Body is found not to be convenient in Inflammations of the Face or Eyes; and therefore most People omit bathing while these Inflammations continue; yet I have known severals bath their Body, even during the Inflammation, without receiving any Prejudice. I am however persuaded that it is better at such Times to use only half Baths, or to bath no more than the Legs. I cannot call to mind any other Distemper for which this Well is proper, that interferes with bathing; but a great many come to this Place, with whom Bathing does not agree, on account of their Weakness, the Unsoundness of their *Viscera*, especially their Lungs, or some Particularity of Constitution.

It is common with such as have Ulcers or Tumors, to put the Part affected into a convenient Vessel of warm Water, and keep

it

it there for the Space of half an Hour or thereby, from Time to Time waſhing the Ulcer, or gently rubbing the Tumor. This is their daily Practice Morning and Evening; thro' the reſt of the Day they dip Linen Rags in the Water, and keep them by Way of Compreſſes, on the Ulcer or Tumor, moiſtening them as they dry with the Water, which they uſe either hot or cold. When the Ulcer or Tumor is ſo ſituate, that it cannot be put into the Water, they uſe it by Way of *Fotus* Morning and Evening, and apply wet Linen Rags, as I hinted before. They have another Way of uſing the Water externally, eſpecially when the Lips of the Ulcer are hard and ſwollen, they pour the Water when it boils into a proper Veſſel, and place the Part affected over it, covering both the Veſſel and the Limb with a Piece of thick Flannel, to keep in the Steam. In hard Tumors, and where the Sinews are contracted, many let the Water fall from on high upon the Part affected.

The Water is commonly drunk in the Morning between the Hours of Six and Eleven; ſome both begin and end latter; They that allow moſt Time, and drink gradually, take the beſt Method. None is drunk after Dinner. This Water is con-

ſtantly every Day drunk by moſt Patients, eſpecially ſuch as ſtay only three, four or ſix Weeks. I am however of Opinion, even ſuch would reap more Benefit, if they ſometimes intermitted a Day; much more ought ſome Days to be intermitted by thoſe who ſtay three, four, or ſix Months, and ſometimes Years.

It is not eaſy to aſcertain the Quantity of Water commonly drunk, People taking more or leſs as they think it agrees with them; but moſt People are apt to exceed in the Quantity, eſpecially the poorer Sort, who frequently drink in one Morning three, four, or five *Scots* Pints of Water. I remember that about two Years ago, I happened to be at the Well about three o' Clock in the Afternoon, at which Time a Country Man made an End of his Sixteenth Pint, I ſtill mean *Scots* Meaſure; the Truth of which I was aſſured of by ſeveral preſent. The Fellow ſaid that he had neither vomited, nor been any other way uneaſy, than for a ſhort While troubled with a Giddineſs of his Head. He had been only eight Hours in throwing this monſtruous Quantity into his Stomach.

I never preſcribe, where I have Acceſs to adviſe, to grown Men, more than three Chopins, or a Quart at moſt, and this

Quan-

Quantity but ſeldom, always adviſing them to begin with a leſſer Quantity, and encreaſe gradually, till they come to a proper *Quantum*. Women and Men of weak Conſtitutions, I ſeldom adviſe to drink more than a Pint, and that with the Reſtrictions juſt mentioned. To Children I preſcribe according to their Age and Conſtitution, from a Jill or half an *Engliſh* Pint to a Chopin; or, tho' very rarely, three *Engliſh* Pints. Such as approach to the Age of Men and Women drink in Proportion.

As to preparatory Medicines, an Emetic or two, and two or three cathartick Doſes, ſhould in ſome Caſes be given. Theſe Doſes may be preſcribed more or leſs frequent according to the Diſeaſe and Conſtitution of the Patient. The Medicines commonly uſed during the drinking of the Waters, are in the Beginning larger Doſes of *Sal Glauberi* and *Polychreſtum*, and afterward leſſer Quantities; of theſe two Salts I prefer the laſt for frequent Uſe: *Syrup* of *Buck-thorn* is often taken along with the Water, and *Aix Sulphur* is pretty much uſed, and with ſome agrees very well. There is alſo a Preſcription of Pills very much in uſe here; they were ordered by an eminent Phyſician, when he was at the Well ſeveral Years ago, and given by him

to an Apothecary for a general *Recipe* to all ſuch who ſhould at any Time uſe the Water. Theſe Pills are a Compoſition of *Gambogia*, *Reſin* of *Jalap*, *Aloes*, and (if I miſtake not) *Scammony*, which to all Intents are a ſtrong Hydragogue.

And here I cannot but obſerve a general Practice which I can by no Means approve of, *viz.* the exorbitant Uſe of purging Medicines along with the Water. There is nothing more ordinary among the meaner Sort, than to take large Quantities of common Sea Salt in the Water, and with thoſe of better Condition, to uſe in like Manner what is falſely called *Epſom Salt*, and is little different from the other; with theſe, and ſometimes with *Glauber*'s *Salt* they purge themſelves briskly. But what makes it yet more unjuſtifiable, they repeat every Day, or every other Day, theſe Doſes during the whole Time of drinking the Waters. I do not however diſpute againſt the Uſe of theſe Purges in all Caſes, ſince they may be ſometimes neceſſary, as they actually are in the firſt Days of Drinking; but only am of Opinion that they ſhould not be ſo much or ſo long inſiſted on. Tho' I have frequently ſeen the bad Conſequences of theſe Methods, I ſhall only take Notice, that from the ſtricteſt Obſervations

ſervations I have been able to make, I can diſcover this Water to be only an *Alterant* and *Diuretick*. 'Tis true it generally opens the Belly, and with ſome it purges. As to the firſt, I believe a Quantity of any Water might have ſomething of the like Effect, tho' I acknowledge that this does it more than common Water, by reaſon perhaps of the mineral Salt in it, yet I cannot find that it operates as a ſtrong or univerſal Cathartick; for as to its purging with ſome, I believe that will be found owing to their drinking too large Quantities, or to a very lax State of the Stomach and Inteſtines, or to ſome Singularity of Conſtitution.

Upon the whole, if the Water paſſes freely by Urine, and keeps the Belly open, there will be leſs Need of any Helps; but till that is effectuated, both Catharticks and Diureticks ſhould be given. If the Water ſtay in the Body long, it will be neceſſary to let Blood, which will facilitate the Operation of Diureticks, and prevent feveriſh Fits. A ſmall Glaſs of *Lisbon* Wine, in which Aromatic and bitter Materials have been infuſed, taken at, or ſoon after the Time of drinking the Water, helps weak Stomachs to digeſt it, and prevents that Heavineſs and Inclination to ſleep, which

which tender People complain of, after drinking the Water. To Women who are hysterick, and Men that are much in the same Condition with weak Stomachs, sinking Spirits, &c. I give *Sal Succini*, either by it self, or mixt with other Diureticks, and in such Cases I have always found it answer very well.

The *Regimen* during the using of the Water needs not be very strict: Milk, salted Meats, Eggs and Fish, are not a very proper Diet. Riding and moderate Exercises assist the Water. I need not mention Temperance, avoiding Colds, &c. After dropping the Use of the Waters, there is no great Necessity in general, of taking any Medicines; but I shall have Occasion below to take Notice in what Distempers they are most necessary.

The Water of *Moffat Wells* is of great Service in Gripings of the Guts, Cholicks, and Pains in the Stomach. I need not observe that bathing in it gives Relief in Gripings and Cholick Pains, since all tepid Baths do the same. I have frequently observed it do great Service in bilious and nephritick Cholicks; yea I have known it cure Persons who had been long troubled with nervous and hysterick Cholicks. 'Tis true, in these Disorders it sometimes fails; but

but I am perſwaded it would ſucceed better, if ſuch Patients inſiſted leſs on being purged, by drinking too large Quantities of the Water, taking too often purging Salts with it, or perhaps both; for my Part, inſtead of endeavouring to purge ſuch Patients, (except the firſt Day or two, or in Caſes of Neceſſity) if I find the Water have that Effect, I frequently give a Doſe of *Laudanum* at Bed-time. I have known Drinking and Bathing very much leſſen or intirely remove Pains in the Stomach with or without a Swelling, even when the Diſtemper had been of long Continuance: Of this we have daily Inſtances, as well as of its wonderfully ſtrengthning weak Stomachs, recovering the Tone of the Fibres, and creating an Appetite even to ſuch as had long loſt all Reliſh for Victuals by continued Debauches, drinking of Spirits, *&c.* In a Word, I believe this Water to be ſecond to few Medicines in moſt Diſorders of the Stomach and Inteſtines.

The Gravel is another Diſtemper for which this Water is very proper, for it frequently carries off great Quantities of Sand and clears the urinary Paſſages, curing Iſchuries, and, if I was not miſtaken in the Diagnoſtick, ulcerated Kidneys. As to the Stony Gravel, I do not know that it has done

done any great Service in that Case, except perhaps by dislodging the Stones from the Kidneys, while they were yet small enough to pass through the Ureters. I believe it would not be amiss, if such as are troubled with the Gravel should drink for some Days both before and after the Use of the Waters, a Decoction of the five opening Roots, or of some such emollient and diuretick Materials.

Some use this Water for the Gout: I doubt not but it may be of some Service by bettering the Stomach and Juices; but I cannot vouch for any Feats it has done in this Distemper.

In the Beginning of Palsies it has done considerable Service: Of this we had Instances last Summer in two Gentlemen, who were troubled with a Numbness, and almost total want of Feeling, with a great Feebleness of all their Limbs, especially their Legs; after being well purged, they used only the *Sal succini* with the Water, and that not every Day, took a Glass of Bitters daily, and bathed thrice a-week, using the Water warm in the Evening, and the same again cold next Morning; at which time they continued only a few Minutes in it. One of these Gentlemen was perfectly recovered, and the other became much better:

ter: But I believe this Water can do no great Matters in the great nervous Diſtempers when they are formed; it may however, with the Aſſiſtance of other Medicines, be a Preventer of theſe terrible Maladies, by helping Cachexies, ſweetning the Juices, *&c.* Many likewiſe find their Account in this Water, for bringing down an over-grown and unwieldy Habit of Body, and carrying off ſpontaneous Laſſitudes.

In Obſtructions of the *Menſes* uſing half Baths is very proper; but I cannot ſay I have found the drinking of the Water anſwer directly as a Provoker of theſe Evacuations, only, as it reſtores the Vigour of the Stomach, and betters the whole Conſtitution, it is uſeful in ſuch Caſes. It does Service in ſome hyſterick and melancholick Ailments; and it is with Juſtice famous for curing Barrenneſs, which it has frequently done to ſuch as were even in Deſpair of having Children: And it has been found of great Service in all female Weakneſſes, and moſt other Diſorders incident to that Sex. It is alſo an excellent Remedy in old Gleets, whether natural or cauſed by Venereal Diſorders; only in this laſt Caſe I would caution every one not to uſe the Water, till they have Reaſon to believe that the Venereal Taint is removed;

for

for if it is not, the Water will as effectually as any Quack's Medicine, throw the Diſtemper into the Blood.

Such as are troubled with Rheumatick Pains and Aches find both from Bathing and Drinking very great Relief: Nor is this Water a leſs ſovereign Remedy to ſcorbutick Patients, many of whom I have ſeen cured by it; they uſe it both Ways, and many great Cures have been brought about, even when the Diſtemper had been of long Continuance, when the Limbs were monſtrouſly ſwelled and almoſt uſeleſs, and the Skin covered all over with Scales, Scurf and Scabs: The Water however is moſt to be depended on in the Beginning of this Diſeaſe, after general Evacuations, and before it has gone beyond the ſecond Stage, as deſcribed by *Boerhaave* in his *Aphoriſms* on this Subject; for certainly when the Fibres are all relaxed, the Body dropſical, *&c.* this Water can be little ſerviceable, if not detrimental: And of this we have yearly Inſtances. It is likewiſe found to be a very good Medicine uſed both outwardly and inwardly for the Itch, with which this Country is peſtered; and cures the *St. Anthony's Fire*, which perhaps is ſomething a-kin to the Scurvy or Itch, and is alſo very frequent here and in the Neighbour-

bourhood: Theſe *Roſes*, as the Country People call them, return to many in the Spring and Autumn, and are introduced by a ſmall Fever. In a Word, this Water is a good Medicine in moſt cutaneous Eruptions and Foulneſſes.

I come now to the *King's Evil*; but before I make any Obſervations about it, I ſhall premiſe by way of Caution, that in this and all other Diſtempers for which People reſort to this Place, the Water is not to be drunk while the Patient has a Cough, even tho' a ſlight one, for it ſeldom fails to increaſe and bind it: It is alſo to be preſcribed with Caution when the Patient is hectically diſpoſed; and it will moſt certainly do Miſchief where there are Tubercles or other Infarctions in the Lungs: But theſe Caſes only excepted the Water may be uſed with great Freedom.

Before the ſcrophulous Patient begins to make Uſe of the Water he ought to be vomited and well purged; nor would it be amiſs for him to take ſome Doſes of ſweet Mercury in the Intervals of his Purging: 'Tis true many ſcrophulous Patients cannot with Safety take Mercury, and I do not think that it ought with any to be much or long inſiſted on, but I have experienced that a few Doſes of it have agreed with many

ny, and promoted the Success of the Water: To these Patients I frequently give some Doses of Rhubarb by itself, or with 2 or 3 Grains of Calomel, on the Days when the drinking of the Water is omitted. In these Intervals I likewise give antiscorbutick Infusions or Juices, and at other such times emollient and diuretick Infusions or Decoctions; these may be Helps, but the Water itself is mostly to be relied on; and in my Opinion the Cure is chiefly owing to the Drinking, tho' without doubt the external Application is of considerable Service in cleaning the Sores, easing the Pain, healing the Ulcers and otherwise; yet while the scrophulous Humour is in any Quantity in the Blood, the Ulcers either do not heal, or close up fungous, and soon break out again in the same or another Place: But when that Venom is thrown out or overcome, all the Ulcers heal up surprisingly in a few Days; which makes me believe that the many and great Cures performed here upon scrophulous Patients are in a great measure to be ascribed to the drinking of the Water. Where the Ulcers are foul and fungous, *red* and *yellow precipitate*, *burnt Alum*, or some such escharotick Powders, are used by themselves or mixed with some Ointment for cleaning: To the same Pur-

pose

poſe are uſed *Ung. Ægyptiacum*, *Balſ. virid. &c.* When the Lips of the Ulcers are inflamed, and the Parts round them ſwelled and hard, beſides fomenting with the Water, and the other Methods of applying it hinted above, there are uſed emollient Fomentations, Cataplaſms and various Plaiſters to the ſame Intent, the beſt of which I find to be that made of two Parts *Gum Galbanum*, and one Part *Melilot* Plaiſter. This Paper would ſwell to too great a Bulk, and perhaps be leſs ſuited to your Deſign, if I ſhould give a particular Account of the various Appearances of this Diſeaſe in the many ſcrophulous Patients I have ſeen cured here: I ſhall therefore only take notice, that it is proper for the ſcrophulous, after dropping the Uſe of the Waters, to recommence purging and mercurial Doſes for ſome Time, and to perſiſt in the Uſe of emollient and diuretick Medicines, and among theſe chiefly the *Millipedes*.

To conclude all, I can aſſure you I have never once ſeen this mineral Water fail to cure the Scrophulous when they were able or fit to uſe it, that is, when the Conſtitution was not quite decayed, or when they were free from the Diſeaſes that forbid its Uſe, and when they were willing to allow it a ſufficient Time, and that is only a few Seaſons.

VIII. *Experiments on the Medicinal Waters of* Moffat, *by* Andrew Plummer, M. D. *Fellow of the Royal College of Physicians, and Professor of Medicine in the University of* Edinburgh.

Having obtained, by the Favour of Mr. *Milligen*, a considerable Quantity of the mineral Water of *Moffat*, carefully put up at the Fountain in the Month of *April*, and a Parcel of Stones taken from the Bottom of the upper Well, and some dug from the same Vein as it crosses the Rivulet below the Precipice upon which the Wells stand, I thought an Attempt to discover the Nature of this celebrated mineral Water, by a chemical Analysis and other Experiments of that kind, would not be unacceptable to the Curious, and might in some measure be useful to illustrate its Effects in the Cure of Diseases.

Above sixty Years ago Mr. *Mackaile* published a *Topographico-Spagyrical* Description of *Moffat* Wells; in which he concludes, but from very precarious Principles, that this Water is impregnated with the *putid Sulphur* of *Antimony* and *Nitre*; but

but in another Place he thinks it neceſſary to add to theſe natural *Sal Ammoniac*: This Gentleman indeed writes in the Dialect of an Adept, but moſt unlike a true Chemiſt, declares againſt Experiments, and aſſerts, that an Analyſis of the Water would be to no Purpoſe, and therefore never made the Trial. I ſhall not trouble the Reader with any further Remarks on this Author, but ſhall impartially relate the Experiments I made on this Water, and the Stones taken from the Vein on which it runs.

The mineral Water tried by the hydroſtatical Balance at the Fountain, and compared with the Water of a Rivulet near the Well, was found ſomewhat lighter than it; for the ſpecifick Gravity of the mineral Water was to that of the other Water as 838 to 840.

The mineral Water brought from *Moffat* to *Edinburgh*, in Bottles well corked and waxed about the Neck, had a ſtrong ſulphurous Smell, but appeared equally limpid and clear as common Spring-water, tho' at the Fountain it has a milky or bluiſh Colour: Upon firſt opening the Bottle the Water taſted as ſtrong, to my Senſe, as when I have drunk it at the Well; but next Day, the Bottle being half empty, the

Water had quite lost its distinguishing Taste and Smell.

I put some Grains of the fresh Powder of Galls into a small Quantity of the Water, but it did not strike a black or violet Tincture therewith, tho' I set the Glass in a Sand-heat for some Hours. A strong Infusion of red Roses in common Water poured into an equal Quantity of the mineral Water, was only diluted and made fainter, as if so much simple Water had been added to the Infusion, and the same happened with Syrup of Violets. This Water then gave no Marks of a chalibeate Nature with Galls, nor of Acidity with Tincture of Roses or Syrup of Violets; neither did it produce any Effervescence with alcaline Liquors, as *Ol. Tartar, p. d.* or *Spir. Sal. Ammoniac.* only when the first was dropped into the Water, there appeared a faint blue Cloud suspended in it. Acid Liquors, as *Sp. & Ol. Vitriol. Sp. Nitr. &c.* added to these Mixtures with *Alcalis*, after an Effervescence, produced a milky Colour, but no Precipitation. The same acid Liquors dropped into the simple mineral Water made no sensible Effervescence, only the Mixture with *Sp. Nitri* smoaked a little, and some Bubbles of Air rose from the Bottom, but all of them turned the Water more or less milky.

ky. Theſe *Phænomena* diſcover the ſulphurous Nature of the Water, but this Sulphur muſt be very ſubtile, volatile and in ſmall Quantity, ſeeing the Water expoſed to the Air ſoon loſes that Smell and Taſte which at firſt ſo remarkably affect the Organs of theſe Senſes; and ſeeing acid Liquors cannot ſo unite the Particles of this Sulphur as to make them fall to the Bottom or ſeparate from the Water.

I made a great many Attempts to fix this Sulphur and render it conſpicuous, but without Succeſs, and therefore I ſhall not trouble the Reader with theſe fruitleſs Experiments; only there is one which had almoſt led me into a Miſtake, until by further proſecuting the Experiment I diſcovered the Truth: But having ſpoke of this Matter to ſome Gentlemen before I knew my Error, I muſt take this Opportunity to relate the whole Matter. Having put a few Grains of *Saccharum* or *Vitriolum Saturni* (made with *Aq. fort. ſimpl.* diluted with a triple Quantity of common Water and Litharge) into 2 Ounces of *Moffat* Water, this preſently turned of a reddiſh Colour, after ſtanding ſome Minutes the Water grew more pellucid, and the red Particles uniting fell moſtly to the Bottom, and ſome ſmall Flakes ſwam on the Surface; This Matter ſepara-

ted from the Water resembled the *Sulphur auratum Antimonii*; and indeed I imagined that this was the Sulphur which impregnates the Water coagulated and fixed. That I might therefore procure a sufficient Quantity of this Matter to discover its Nature by other Trials, I got a fresh Parcel of mineral Water from *Moffat* and repeated the Experiment: I put 3 Drachms of the *Vitriolum Saturni* by Degrees into 3 Chopins or *English* Quarts of the Water, and poured the muddy Liquor into a Filter, in which there remained a Powder not so red as in the former Experiment, but of a brownish Colour, which when dry weighed 20 Grains. I put 5 Grains of this Powder upon an Iron Plate made red hot, it soon melted and smoaked a little, but did not flame; when the Iron was cold I found upon it a thin Scurf of Lead. Upon the rest of this Powder I poured some *Ol. Tartar. p. d.* and set the Glass to digest on a Sand-heat, but the Liquor acquired no Tincture as it would have done from a sulphurous Substance: So that in this Experiment the Acid of the *Vitriolum Saturni* mixing with the Water had let fall some of the Particles of the Litharge, which by Fire afterwards returned to Lead. That I might know what remained in the Water which had

had paſt thro' the Filter, I put about the Half of it into an Iron Kettle, to evaporate it in Haſte, and I got a Drachm and five Grains of a ſaline or vitriolic Subſtance, of a brown Colour, and not ſo ſweet and ſtyptick to the Taſte as the *Vitriolum Saturni*, which was diſſolved in the Water. The Difference, I preſume, was owing partly to ſome of the Litharge being precipitated, partly to the Iron Kettle in which it was boiled, and laſtly to ſome of the proper Salt of the Water, being united to this vitriolic Subſtance.

Twelve *Scots* Pints of the Mineral Water was diſtilled with a gentle Heat, from Glaſs Veſſels, with the Joinings luted; the Water which came over was perfectly limpid, and had no Smell or Taſte, but a little *Empyreuma*; what remained in the Body had no Smell either, but taſted ſomewhat ſaltiſh. When $\frac{3}{4}$ or thereby was brought over, there appeared at the Bottom a good Quantity of a muddy Sediment, which I ſeparated from the Liquor, and carried on the Evaporation in a low, wide mouth'd Glaſs. When the Water was reduced to ſomewhat leſs than a Chopin, it ſeemed well ſaturated with a Salt; for it was thick and bubbled, as when a lixivial Salt is boiled near to Dryneſs. When all

was cold, I found at the Bottom a dirty Salt, mixt with Mud or Earth; the Saline Particles were so very small, that I could not observe their Shapes; but the Liquor had a very briny or muriatick Taste. I proceeded to evaporate and crystalize the remaining Liquor (except two Ounces reserved for other Trials) till I gather'd all the Salt, which weighed 4 Drachms and 2 Scruples. As this Salt was very brown and earthy, I dissolved it in some of the distil'd Water, filter'd the Solution, and crystaliz'd it again; then there appeared very clean and beautiful Cristals, of an uncommon Figure, of very different Sizes, but almost exactly similar; some of which are represented of their natural Bigness on *Plate* I.

Fig. 1. Shews a small Crystal, but very complete and regular.

Fig. 2. Represents one of the largest, somewhat rugged at the Corners.

Fig. 5. Is the Reverse of the former, shewing its Stalk.

Fig. 3. Shews two joined by one Side.

Fig. 4. Represents 2 irregularly blended.

Each of these Crystals is made up, as it were, of four Triangles joined together, so as to make up a little hollow Capsule or Dish, with Brims turned outward or horri-

zontally

zontally, and ſtands upon a little Pedeſtal or Stalk. Beſides theſe Cryſtals there were others of a cubical Shape, but both Sorts had evidently the Taſte of Sea Salt.

I put two Drachms of the Salt obtained from *Moffat* Water into an Iron Ladle, and ſet it on a clear Fire, till the Iron was red hot; the Salt ſmoked and crackled much as in the Decrepitation of common Salt, but it neither melted nor flamed, nor did it much diminiſh in Weight; for after an Hour's toaſting, it had only loſt 18 Grains; which makes it evident that this Salt is neither *Nitre*, nor *Sal-ammoniac*.

This decrepitate Salt, with four Scruples of the Salt which had not felt the Fire, was put into a ſmall Glaſs retort, and a Drachm of Oil of *Vitriol* poured upon it, there aroſe copious Fumes, which were immediately confined, by applying a Receiver: The Diſtillation was carried on with a Fire gradually increaſed, the Receiver was filled with white Fumes, and there came over about two Drachms of a volatile ſmoking Spirit, which anſwered all the Characters of *Glauber*'s Spirit of Sea Salt.

Having diſſolved ſome Silver in *Aqua Fortis*, I divided the Solution into ſeveral Portions; into one I let fall ſome Drops of the Spirit above deſcribed; into another I

put

put some Grains of the Salt of *Moffat* Water, into a third some of the Water evaporated to $\frac{1}{36}$, and each of these made a Precipitation of the Silver. All which plainly show that this Water is impregnated with common Salt or *Sal-Gem*. Altho' the Saline Crystals obtained from *Moffat* Water, differ very much in Appearance from the Sea Salt commonly used, yet having dissolved some common Salt in pure Water, after Filtration, and a very slow Evaporation, I observed many of the Saline Particles assume a Shape not unlike that described above; but the Crystals of the common Salt approached nearer to little hollow Pyramids, with square Bases.

I mentioned before, that I had reserved 2 Ounces of the Water, when it was evaporated to $\frac{1}{36}$ or thereby, and was strongly impregnated with Salt. Into a small Quantity of this Brine (as I may call it) I let fall some Drops of *Ol. Tartar. p. d.* which caused no Effervescence, but presently produced a milky Colour and Coagulation; upon standing a while, the upper Part of the Liquor turned clear, and of a Whey Colour. The same happened when *Spir. Sal Ammon. cum Alcal. fixo* was dropt into another small Parcel of the same Water; some Drops of *Spir. Vitriol.* put into these

theſe Mixtures, after Effervescence, diſſolved the Coagulation, and rendered the Liquor pellucid: But *Sp. Vitriol.* or other acid Liquors dropt into the Brine by itſelf, cauſed no Effervescence, or other Change in Colour or Conſiſtence. The Difference between theſe Phænomena, and thoſe formerly obſerved in the freſh Water, upon mixing the ſame Liquors, is remarkable; for when acid Spirits were dropt into the freſh Water, they always turned it milky, becauſe then the Water was impregnated with its Sulphur, which the acid Liquors, in ſome Meaſure, coagulated ſo as to change the Colour of the Water: but alcaline Liquors added to the freſh Water produced little Change, becauſe a ſmall Quantity of Salt was diſperſt through a great Bulk of Water. On the other Hand, when the Sulphur was carried off by Heat, and the Salt gathered into narrower Bounds, then the Acids had no Effect, but the *Alcalis* had a conſiderable one, by joining themſelves to the Particles of Salt, and collecting them.

The muddy Sediment which was firſt ſeparated from the Water, when dry weighed 25 Grains; it was of a ſandy Colour, and had a little Saltneſs on the Tongue. I put this Powder into an Iron Spoon, made red hot, and kept it on the Fire; it ſmoked

a little, turned black on the Surface, afterwards red, and at last perfectly white. When cold it weighed 17 Grains, and felt like Chalk.

The Earth which was separated from the Solution of the Salt by Filtration, weighed 15 Grains. It had no Saltness, but was more gritty between the Teeth than the former. When calcin'd it smoked little, scarce changed its Colour, and when cold weighed 10 Grains.

I poured upon small Parcels of these earthy Substances both acid and alcaline Liquors; but the Remains were so small, that I could not discover whether they contained any metallick Particles or not.

The Stones dug from the Vein, as it passes thro' the Bottom of the upper Well at *Moffat*, are made up partly of a crystaline Spar cut, as it were, into many polisht Surfaces like Diamonds, partly of a shining Substance of a golden Colour, but mostly of a dusky or leadish colour'd Ore.

Tho' these Stones seemed to abound in Sulphur, yet none of it would sublime in clos Vessels, but to obtain it in some Shape, I poured upon two Ounces of the Ore in Powder a Solution of Salt of Tartar, by Digestion this extracted a very deep red Tincture, from which by pouring

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in *Spir. Vitriol.* I got a Powder of a Citron Colour, weighing 17 Grains, which put upon a red hot Iron, made a faint blew Flame, and had a sulphurous Smell.

Two Ounces of the same Mineral, mixt with an equal Quantity of Tartar and Nitre in Powder, was put into a red hot Crucible in a melting Furnace; after half an Hour's Fusion, the Matter was thrown into an hollow Cone, or antimonial Horn, it did not separate into a metallick or reguline Part and *Scoriæ*; but there appeared many shining Particles dispersed through the Mass, like very foul Antimony. The whole was again reduced to a Powder, and Water poured on it, which acquired a very fetid and sulphurous Smell, and a Taste much resembling the fresh Mineral Water, but much stronger. This Water likewise, with Spirit of Vitriol, afforded a Sulphur like the former. The metallick Matter, freed from the Salts by frequent washing, was again brought to Fusion with Nitre and Tartar, and now I found at the Apex of the Cone, a Piece of very pure Copper, weighing 42 Grains, which answered all the Characters of that Metal.

I acknowledge that I could not discover any Marks of Copper in the Water it self, by any Trials I could make; but as this

Water

Water washes a Vein abounding with Copper and Sulphur, and is it self impregnated with Salt, I may conclude that the Principles contained in this medicinal Water, are a very subtile and volatile Sulphur, at least some constituent Parts of Sulphur, some Particles of Copper and *Sal-gem*, or common Salt.

IX. *An ESSAY on the Art of* Injecting *the Vessels of Animals, by* ALEXANDER MONRO, *Professor of Anatomy in the University of* Edinburgh, *and* F. R. S.

THE Method of filling the Vessels of Animals with a coloured Liquor, which afterwards hardens, and by keeping the Vessels distended and firm, gives an Opportunity of observing more exactly their Distribution, Situation and Diameters, and of discovering Numbers of their Branches and Communications, that would otherwise be unsearchable, is a modern Improvement that has contributed considerably to explain the Animal Oeconomy. Anatomists are now sufficiently acquainted with the Manner of filling the larger Trunks

Trunks, but few have hit on the Art of injecting the very ſmall Capillary Tubes; wherefore I hope it will not be unacceptable to give you a Detail of what I have found after a conſiderable Number of different Trials, to have ſucceeded beſt in this way of Injection, which may at leaſt have one good Effect, tho' I ſhould fail of being the Diſcoverer of this Art, namely, of ſaving unneceſſary Trouble to other Enquirers after it, and may ſpur on ſome other more lucky Perſon to communicate the whole of it, by which more Anatomiſts being employed in ſearching out the minute Veſſels, more Diſcoveries may be made, than when it is confined to ſo few as it is at preſent.

In deſcribing the Trials I have made to ſucceed in ſubtle Injections, I can ſcarce help mentioning ſeveral Things which are commonly known to all who practiſe Injections of any kind; and I ſhall be the leſs anxious to ſhun them, that ſcarce any Anatomical Books deſcribe with Accuracy the Method of Injecting; and therefore this Eſſay may ſave the young unexperienced Anatomiſts the Trouble of fruitleſs Trials, which I beg you'll accept of as an Apology for repeating ſome Things that have been long familiar to you.

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The Inſtrument with which the Liquor is commonly thrown into the Veſſells is, you know, a tight eaſy-going Syringe of Braſs, to which ſeveral ſhort Pipes are fitted and can be fixed by Screws, the other Extremities of theſe Pipes being of different Diameters without any Screw, that they may ſlide into other Pipes which are ſo exactly adapted to them at one End, that when they are preſſed a little together nothing can paſs between them; and becauſe their Coheſion is not ſo great as to reſiſt the puſhing Force of the Injection, which would drive off this ſecond Pipe and ſpoil the whole Operation, therefore the Extremity of this ſecond Sort of Pipes, which receives the firſt Kind, is formed on the outſide into a Square bounded behind and before by a riſing Circle, which hinders the Key that cloſely graſps the Square Part from ſliding backwards or forwards; or a Bar of Braſs muſt ſtand out from each Side of it to be held with the Fingers. The other Extremity of each of theſe ſecond Sort of Pipes is of different Diameter, and near it a circular Notch, capable of allowing a Thread to be ſunk in it, is formed; by this the Thread tying the Veſſel at which the Injection is to be made will not be allowed to ſlide off.

Beſides

Beſides this Form deſcribed, common to all this ſecond Sort of Pipes, we ought to have ſome of the larger ones with an additional Mechaniſm for particular Purpoſes; as for Inſtance, when the larger Veſſels are injected, the Pipe faſtned in the Veſſel ought either to have a Valve or a Stop-cock that may be turned at Pleaſure, to hinder any thing to get out from the Veſſel by the Pipe; otherwiſe, as the Injection in ſuch a Caſe takes Time to coagulate, the People employed in making the Injection muſt either continue all that While in the ſame Poſture; or if the Syringe is too ſoon taken off, the injected Liquor runs out and the larger Veſſels are emptied. When the Syringe is not large enough to hold at once all the Liquor neceſſary to fill the Veſſels, there is a Neceſſity of filling it again: If, in order to do this, the Syringe was to be taken off from the Pipe fixed in the Veſſel, ſome of the Injection would be loſt, and what was expoſed to the Air would cool and harden; therefore ſome of the Pipes ought to have a reflected curve Tube coming out of their Side, with a Valve ſo diſpoſed that no Liquor can come from the ſtraight Pipe into the crooked one, but on the contrary, may be allowed to paſs from the crooked to the ſtraight one; the Inje-

&tor then taking care to keep the Extremity of the reflected Pipe immersed in the Liquor to be injected, may, as soon as he has pushed out the first Syringe-full, fill it again by only drawing back the Sucker, and repeating this quickly, will be able to throw several Syringe-fulls into the Vessels.

All these different Sorts of Pipes are commonly made of Brass.

The Liquors thrown into the Vessels with a Design to fill the small capillary Tubes are either such as will incorporate with Water, or such as are oily; both kinds have their Advantages and Inconveniencies, which I shall mention in treating of each, and shall conclude with that which I have found by Experience to succeed best.

All the different kinds of Glue, as *Ichthyocolla*, *Syths*, common Glue, *&c.* dissolved and pretty much diluted, mix easily with the animal Fluids, which is of great Advantage, and will pass into very small Vessels of a well chosen and prepared Subject, and often answer the Intention sufficiently, where the Design is only to prepare some very fine Membrane, on which no Vessels can be expected to be seen so large as the Eye can discover whether the transverse Sections of the Vessels would be circular,

cular, or if their Sides are collapſed. But when the larger Veſſels are alſo to be prepared, there is a manifeſt Diſadvantage to the Uſefulneſs and Beauty of the Preparation; for if nothing but the glutinous Liquor is injected, one cannot keep a Subject ſo long as the Glue takes of becoming firm, and therefore in diſſecting the injected Part, ſeveral Veſſels will probably be cut and emptied: To prevent this one may indeed either ſoak the Part well in Alcohol, which coagulates the Glue; but then it becomes ſo brittle, that the leaſt Handling makes it crack; and if the Preparation is to be kept, the larger Veſſels appear quite ſhriveled when the watery Part of the Injection is evaporated; or the Efflux of the Injection may be prevented by carefully tying every Veſſel before we are obliged to cut it, ſtill however that does not hinder the Veſſels to contract when the Glue is drying. If to obviate theſe Difficulties the glutinous Liquor ſhould firſt be injected in ſuch Quantity as the capillary Veſſels will contain, and the common oily or waxy Injection is puſhed in afterwards to keep the larger Veſſels diſtended; the Wax is very apt to harden before it has run far enough, the two Sorts of Liquors never miſs to mix irregularly, and the whole appears interrupt-

ed and broken by their ſoon ſeparating from each other ; which is ſtill more remarkable afterwards, when the watery Particles are evaporated.

Spirit of Wine coloured mixes with Water and Oils, and ſo far is proper to fill the very ſmall Veſſels with, but on the other hand it coagulates any of our Liquors it meets, which ſometimes block up the Veſſels ſo much that no more Injection will paſs ; then, it ſcarce will ſuſpend ſome of the Powders that prove the moſt durable Colours ; and as it intirely evaporates, the Veſſels muſt become very ſmall ; and the ſmall Quantity of Powder left, having nothing to ſerve for connecting its Particles together, generally is ſeen ſo interrupted, that the ſmall Ramifications of Veſſels rather have the Appearance of random Scratches of a Pencil than of regular continued Canals.

Melted Tallow with a little Mixture of Oil of Turpentine may ſometimes be made to fill very ſmall Veſſels and keeps the larger ones at a full Streach ; but where any Quantity of the animal Liquors are ſtill in the Veſſels it is liable to ſtop too ſoon, and never can be introduced into Numbers of Veſſels which other Liquors enter ; and it is ſo brittle that very little Handling makes

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it crack, and thereby renders the Preparation very ugly.

The Method I have always ſucceeded beſt with in making what may be called ſubtile or fine Injections is, firſt to throw in coloured Oil of Turpentine, in ſuch a Quantity as might fill the very ſmall Veſſels, and immediately after to puſh the common coarſe Injection into the larger ones. The Oil is ſubtile enough to enter rather ſmaller capillary Tubes than any Colouring can; its reſinous Parts, which remain after the ſpirituous are evaporated, give a ſufficient Adheſion to the Particles of the Subſtance with which it is coloured, to keep them from ſeparating, and it intimately incorporates with the coarſer Injection, by which, if the Injection is rightly managed, it is impoſſible for the ſharpeſt Eye to diſcover that two Sorts have been made Uſe of.

All the Liquors with which the Veſſels of Animals are artificially filled, having very faint and near the ſame Colours, would not at all appear in the very ſmall Veſſels, becauſe of their becoming intirely diaphanous, without a Mixture of ſome Subſtance to impart its Colour to them; and where ſeveral Sorts of even the larger Veſſels of any Part were filled, one Sort could

not be diſtinguiſhed from another unleſs the Colour of each was different; which has likewiſe a good Effect in making Preparations more beautiful. Wherefore Anatomiſts have made Uſe of a Variety of ſuch Subſtances, according to their different Fancies or Intentions, ſuch as Gamboge, Safron, Ink, burnt Ivory, *&c.* which can be eaſily procured from Painters. My Deſign being only to conſider thoſe that are fit to be mixed with the injecting Liquors propoſed to fill capillary Veſſels, which is ſcarce ever to be done in any other, except the Branches of the Arteries and of ſome Veins, I ſhall confine my ſelf to the common Colours employed to theſe laſt named two Sorts of Veſſels, which Colours are red, green, and ſometimes blue, without mentioning the others which require very little Choice.

Anatomiſts have, I imagine, propoſed to imitate the natural Colours of the Arteries and Veins in a living Creature, by filling the Arteries with a red Subſtance, and the Veins with a blue or green, from which however there are other Advantages, ſuch as the ſtrong Reflection which ſuch Bodies make of the Rays of Light, and the Unaptneſs moſt ſuch Bodies have to tranſmit theſe ſame Rays, without at leaſt a conſiderable

derable Reflection of the Rays peculiar to themſelves, or in other Words, their Unfitneſs to become completely pellucid; without which the very fine Veſſels after being injected would ſtill be imperceptible. The animal or vegetable Subſtances made Uſe of for colouring Injections, ſuch as Cochineal, Laque, *Rad. Anchuſæ*, Brazil-wood, Indigo, *&c.* have all one general Fault of being liable to run into little Knots which ſtop ſome of the Veſſels, their Colour fades ſooner when kept dry, they more eaſily yield their Tincture when the Parts are preſerved in a Liquor; and Rats, Mice and Inſects will take them for Food; for which Reaſons, tho' I have frequently ſucceeded in injecting them, I rather prefer the mineral kind, ſuch as *Lap. Calaminaris*, *Minium* or Vermilion for red, of which this laſt is in my Opinion the beſt, becauſe it gives the brighteſt Colour, and is commonly to be bought finely levigated. The green Colour generally uſed is Verdigreaſe; but I rather chuſe that Preparation of it called *diſtilled Verdigreaſe*, becauſe its Colour is brighter, and it never runs into ſmall Knots, but diſſolves in the oily Liquors.

The Method of preparing the Injection compoſed of theſe Materials is, to take for

the fine one a Pound of clear Oil of Turpentine, which is gradually poured on 3 Ounces of Vermilion or distilled Verdigrease finely powdered, or rather well levigated by grinding on Marble; Stir them well with a small wooden *Spatula* till they are exactly mixed, then strain all through a fine Linnen Rag: The Separation of the grosser Particles is however rather better made, by pouring some Ounces of the Oil upon the Powder, and after stirring them together strongly, stop rubbing with the Spatula for a Second or so, and pour off into a clean Vessel the Oil with the Vermilion or Verdigrease suspended in it; and continue this Sort of Operation, till you observe no more of the Powder come off, and all that remains is granulated. The coarser Injection is thus prepared; Take Tallow 1 Pound, Wax bleached white 5 Ounces, Sallad Oil 3 Ounces, melt them in a Skillet put over a Lamp; then add Venice Turpentine 2 Ounces; and as soon as this is dissolved, gradually sprinkle in of Vermilion or Verdigrease prepared 3 Ounces; then pass all through a clean, dry, warmed Linnen Cloth to separate all the grosser Particles: And when you design to make it run far in the Vessels, some Oil of Turpentine may be added immediately before it is used.

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The next Thing to be conſidered, and indeed what chiefly contributes to the Succeſs of Injections is, the Choice and Preparation of the Subject whoſe Veſſels are to be filled.

In chuſing a fit Subject take theſe few general Rules: 1. The younger the Creature to be injected is, the Injection will, *cæteris paribus*, go fartheſt, and *vice verſa*. 2. The more the Creature's Fluids have been diſſolved and exhauſted in Life, the Succeſs of the Operation will be greater. 3. The leſs ſolid the Part deſigned to be injected is, the more Veſſels will be filled. 4. The more membranous and tranſparent Parts are, the Injection ſhows better. Whereas in the ſolid very hard Parts of a rigid old Creature, that has died with its Veſſels full of thick ſtrong Blood, it is ſcarce poſſible to inject great Numbers of ſmall Veſſels.

Therefore in preparing a Subject for injecting, the principal Things to be aimed at are, To diſſolve the Fluids, empty the Veſſels of them, relax the Solids, and prevent the Injections coagulating too ſoon: To anſwer all theſe Intentions, Authors have propoſed to inject tepid or warm Water by the Arteries, till it returns clear and untinged by the Veins, and the Veſſels are thereby

thereby ſo emptied of Blood that all the Parts appear white ; after which they puſh out the Water by forcing in Air : And laſtly, by preſſing with their Hands they ſqueeze the Air alſo out. After this Preparation one can indeed inject very ſubtilly, but generally there are Inconveniencies attend it, for in all the Parts where there is a remarkable *Tunica celluloſa* it never miſſes to be full of the Water, which is apt to ſpoil any Parts deſigned to be preſerved either wet or dry ; and ſome Particles of the Water ſeldom miſs to be mixed in the larger as well as ſmaller Veſſels with the oily Injection, and make it appear diſcontinued and broken : Wherefore it is much better to let this Injection of Water alone, if it can be poſſibly avoided, and rather to macerate the Body or Part to be injected a conſiderable Time in Water made ſo warm as one can hold his Hand eaſily in it ; by which the Veſſels will be ſufficiently ſoftned and relaxed, the Blood will be melted down, and the Injection can be in no Danger of hardning too ſoon ; whereas if the Water is too hot, the Veſſels ſhrink and the Blood coagulates : From time to time we ſqueeze out the Liquids as much as poſſible at the cut Veſſel by which the Injection is to be thrown in. The Time this Maceration

is

is to be continued, is always in Proportion to the Age of the Subject, the Bulk and Thickneſs of what we deſign to inject, and the Quantity of Blood we obſerve in the Veſſels, which can only be learned by Experience; at leaſt however Care ought to be taken that the whole Subject or Part macerated is perfectly well warmed all through; and that we continue the Preſſure with our Hands, till no more Blood can be brought away, whatever Poſition we put the Subject in.

When the Syringe, Injections and Subject are all in Readineſs, one of the ſecond Sort of Pipes is choſen as near to the Diameter of the Veſſel by which the Injection is to be thrown as poſſible; for if the Pipe is too large, it is almoſt needleſs to tell, it cannot be introduced. If the Pipe is much ſmaller than the Veſſel, it is ſcarce poſſible to tye them ſo firmly together, but by the wrinkling of the Coats of the Veſſel, ſome ſmall Paſſage will be left, by which Part of the Injection will ſpring back on the Injector, in the Time of the Operation, and the neareſt Veſſels remain afterwards undiſtended, by the Loſs of the Quantity that ouzes out. Having choſen a fit Pipe, it is introduced at the cut Orifice of the Veſſel, or at an Inciſion made

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in the Side of it; and then a waxed Thread being brought round the Vessel, as near to its Coats as possible, by the Help of a Needle, or a flexible Ey'd Probe, the Surgeons Knot is made with the Thread, and it is drawn as firmly as the Thread can allow; taking Care that it shall be sunk into the circular Notch of the Pipe all round, otherwise it will very easily slide off, and the Pipe will be brought out probably in the Time of the Operation, which ruins it.

If there have been large Vessels cut, which communicate with the Vessels you design to inject, or if there are any others proceeding from the same Trunk, which you do not resolve to fill, let them be all carefully now tyed, to save the injected Liquor, and make the Operation succeed better in the View you then have.

When all this is done, both Sorts of Injection are to be warmed over a Lamp, taking Care to stir them constantly, least the colouring Powder fall to the Bottom and burn. The Oil of Turpentine needs be made no warmer than will allow the Finger to remain in it; the other coarse Injection is brought near to boiling. In the mean Time, having wrapt several Folds of Linnen round the Parts of the Syringe which

which the Operator is to grip, and ſecured the Linnen with Thread; the Syringe is to be made very hot, by ſucking boiling Water ſeveral Times up; and the Pipe within the Veſſel is to be warmed, by applying a Sponge dipped in boiling Water to it.

After all is ready, the Syringe being cleared of the Water, the Injector fills it with the finer Injection, and then introducing the Pipe of the Syringe into that in the Veſſel, he preſſes them together, and either with one Hand holds this laſt Pipe firm, with the other grips the Syringe, and with his Breaſt puſhes the Sucker; or giving the Pipe in the Veſſel to be held by an Aſſiſtant, in any of the Ways mentioned in the Deſcription of theſe Sort of Pipes, he grips the Syringe with one Hand, and puſhes the Sucker with the other, and conſequently throws in the Injection, which ought to be done ſlowly, and with no great Force, but proportion'd to the Length and Bulk of the Part to be injected, and Strength of the Veſſels. The Quantity of this fine Injection to be thrown in, is much to be learned by Uſe. The only Rule I cou'd ever fix to my ſelf in this Matter, was to continue puſhing till I was ſenſible of a Stop, which would require a conſiderable

Force

Force to overcome: But this will not hold where all the Branches of any Vessel are not injected; as for Instance, when the Vessels of the *Thorax* only are to be injected; for the *Aorta* bears too great a Proportion to the Branches sent from it, and therefore less fine Injection is requisite here. As soon as that Stop is felt, the Sucker of the Syringe is to be drawn back, that the nearest large Vessels may be emptied. Then the Syringe is taken off, emptied of the fine Injection, and filled with the coarser, which is to be pushed into the Vessels quickly and forcibly, having always Regard to the Strength and Firmness of the Vessels, Bulk, *&c.* of the Part. Continue to thrust the Sucker, till a full Stop, or a sort of Push backwards is felt, when you must beware of thrusting any more, otherwise some of the Vessels will be bursted, and the whole, or a considerable Share of the Preparation you designed will be spoiled by the Extravasation, but rather immediately stop the Pipe by the Turn-cock, and take out the Syringe to clean it, and allow Sufficient Time for the coarse Injection to coagulate fully, before any Part is dissected.

In this Way I have frequently injected the cortical Part of the Brain, *Tunica Choroides* and *Vasculosa* of the Eye, *Periosteum*

ſteum of the Bones of the Ear, Veſſels of the Teeth, of the Skin, Bones, and *Viſcera*, which any of you, Gentlemen, may ſatisfy your ſelves of when you pleaſe, by ſeeing them. As a Specimen of the Succeſs of this Way, I have ſent you herewith the Figure of a little Piece of the *Tunica Villoſa* of the Inteſtines, at leaſt of that Membrane which retains the Air in the internal cellular Coat of the Inteſtines, when they are turned inſide out; and theſe Cellules are diſtended by blowing. In *Tab.* 1. *Fig.* 6. you ſee this Piece of Membrane, as it appears to the naked Eye, only that the deep red Colour with which it is tinged all over in the Original, cannot appear here. In *Fig.* 7. is repreſented the Appearance it had when viewed with a Microſcope, only that what looks like a Sort of Moſs-work here, ſhews itſelf vaſcular, when it is viewed with a Microſcope that magnifies more than the one employed when the Painter drew this Figure.

X. A Demonstration of the Strength of Bones to resist Powers applied to break them transversely, by Dr. WILLIAM PORTERFIELD, Fellow of the Royal College of Physicians in *Edinburgh*,

Gentlemen,

IN the second Edition of my Anatomy of the humane Bones *just now printed, after demonstrating that the Resistance of two cylindrical Bones of unequal Diameters, but consisting of an equal Number of similar Fibres uniformly disposed round each, to Forces applied to break them transversely, will be proportional to their Diameters, I affirm in Page* 28. *That of whatever Figure Bones are, and in whatever Manner their Fibres are disposed, their Strength must always be in a* Ratio *compounded of their Quantity of bony Matter, and of the Distance of their Centre of Gravity, from the Centre of Motion. My worthy Friend Dr.* Porterfield, *who always examines accurately what he reads, having, to satisfy himself, drawn up not only a Demonstration of that Proposition;*

position; but having also considered the Resistances of Bones, in a great many more different Views than I think our Writers in Mechanicks commonly do the Forces of Bodies; and having accidentally let me see the inclosed Paper, I prevailed on him to allow me to send it you, as justly, in my Opinion, deserving a Place in your Collection; and being an excellent Supplement to that Part of my Osteology, I am

Your most obedient Servant,

ALEXr. MONRO.

LEMMA.

THE Sum of the Actions of two or more Agents conspiring to act in parallel Lines, is always as the Sum of their absolute Forces, multiplied into the Velocity of their common Centre of Gravity.

DEMONSTRATION.

Let A, B, (*Tab.* 1. *Fig.* 8.) represent the absolute Force of the Agents A and B, whose common Centre of Gravity is C, and let the parallel Lines A*a*, B*b*, C*c*, represent the Velocities and Directions of the

Agent A, the Agent B, and their common Centre of Gravity C respectively: The Action of Agents being always as Rectangles, under their absolute Forces and Velocities; The Action of A, shall be $A \times Aa$, the Action of B, $B \times Bb$; the Sum of their Actions $A \times Aa + B \times Bb$, and the Sum of their absolute Forces multiplied into the Velocity of their common Centre of Gravity, $A \times Cc + B \times Cc$. I say, $A \times Aa + B \times Bb = A \times Cc + B \times Cc$.

Case 1. If the Velocities Aa and Bb are equal, they shall also be equal to Cc, if therefore Cc be substituted in Place of Aa and Bb, the Sum of the Actions shall be $A \times Cc + B \times Cc$; but this also is the Sum of the absolute Forces multiplied into the Velocity of their common Centre of Gravity, and therefore they are equal.

Case 2. If the Velocities are unequal, let Aa be less than Bb, draw the Line ae, parallel to AB, cutting Cc in f; Aa, Cf, Be shall be equal, which call v. Let $fc = x$, and $eb = z$, hence Cc shall be $= v + x$, and $Bb = v + z$: The Sum of the Actions shall be $Av + Bv + Bz$, and the Sum of the absolute Forces multiplied into the Velocity of their common Centre of Gravity shall be $Av + Bv + Ax + Bx$; which two last we contend are equal.

From

From the Definition of the Centre of Gravity $ac : cb :: B : A$, and by Composition $ac : ac+cb$, that is, $ab :: B : B+A$; but (because of the similar Triangles afc, aeb) $x : z :: ac : ab$; therefore $x : z :: B : B+A$, hence $Bz = Ax + Bx$; and therefore $Av + Bv + Bz = Av + Bv + Ax + Bx$; that is, the Sum of the Actions of the Agents A and B is equal to the Sum of their absolute Forces, multiplied into the Velocity of their common Centre of Gravity.

Case 3. If the Number of Agents be greater than two; let them be supposed three. By *Case* 1. and 2. the Sum of the Actions of two of them is equal to what would arise, did both coalesce in one, and move with the Velocity of their common Centre of Gravity. Hence the Number of Agents are reduced to two, and consequently fall under what has been above demonstrated. By the same Way of Proceeding, 3, 4, 5, or any given Number of Agents, may, (without altering their joint Force or Action) be supposed to coalesce and move with the Velocity of their common Centre of Gravity; and therefore, universally, the Sum of the Actions of any Number of Agents, conspiring to act in parallel Lines, is always as the Sum of their absolute Forces,

multiplied into the Velocity of their common Center of Gravity Q. E. D.

COROLLARY.

Action and Reaction being equal, it follows that the total Resistence of any Number of Powers resisting in parallel Directions is always as the Sum of their absolute resisting Forces (whether arising from Attrition, Cohesion, Weight, Attraction, or any other Cause) multiplied into the Velocity of their common Centre of Gravity.

THEOREM.

The Strength of Bones, whether solid or hollow, that is the Force whereby they resist being broken transversely, is as the Area of their transverse Section, multiplied into the Distance of its Centre of Gravity, from the Centre of Revolution or Fulcrum on which the Bone is supposed to be broken.

DEMONSTRATION.

The absolute Force whereby Bones resist being broken transversely, is the Power of Cohesion uniformly diffused over the whole cohering Surface: And this Power of

of Coheſion is compounded of all the Powers exerted in every Point of that Surface: But theſe Powers reſiſt in parallel Directions (being all perpendicular to the tranſverſe Section of the Bone,) with Velocities proportional to their Diſtance, from their Centres of Revolution: And therefore, (by preceeding *Cor.*) the Strength of the Bone, or total Reſiſtance of all theſe Powers ſhall be as their Sum multiplied into the Velocity of their common Centre of Gravity, that is, as the Area of the tranſverſe Section of the Bone, multiplied into the Diſtance of its Centre of Gravity, from the *Fulcrum* or Centre of Revolution. Q. E. D.

COR. 1.

In comparing the Strength of Bones, if the Areas of their tranſverſe Sections are to one another reciprocally as the Diſtances of the Centres of Gravity of thoſe Sections, from their Centres of Revolution, the Bones ſhall be of equal Strength; and contrarily, if the Bones are of equal Strengh, the Areas of their tranſverſe Sections, and the Diſtances of the Centres of Gravity, from the Centres of Revolution, ſhall be reciprocally proportional.

Cor. 2.

In comparing the Strength of Bones: If the Areas of their transverse Sections are equal, their Strength shall be as the Distances of the Centres of Gravity from their Centres of Revolution; and if those Distances are equal, their Strength shall be as the Areas of their transverse Sections.

Cor. 3.

Since the Centre of Circles coincides with their Centre of Gravity, the Strength of Bones, whether solid or hollow, whose transverse Sections are Circles or *Annuli*, shall be as the Areas of those Sections and their *Radii* jointly.

Cor. 4.

The Diameters and Peripheries of Circles being as their *Radii*, their Strength shall also be as the Areas of their transverse Sections and Peripheries, and as the same Areas and Diameters, jointly.

Cor. 5.

Circles being to one another as the Squares of

of their Diameters, and consequently as the Squares of their *Radii* and Peripheries; it follows, that in solid Bones, whose transverse Sections are Circles, their Strength is as the Cubes of their Diameters, of their *Radii*, and of their Peripheries.

Cor. 6.

Similar Figures being to one another as the Squares of their homologous Sides; the Strength of Bones, whether solid or hollow, whose transverse Sections are similar, must be as the Squares of the homologous Sides of these Sections, and the Distances of their Centres of Gravity from the Centres of Revolution jointly.

Scholium.

In hollow Bones whose transverse Sections are similar, their Strength must also be as the Squares of their Thickness, taken at similar Points of their transverse Sections, and the Distances of their Centres of Gravity from the Centres of Revolution jointly.

For the Lines C*x*, *cx*. H*z*. *hz*. &c. (*See Tab.* 1. *Fig.* 9 & 10.) measuring their Thickness at similar Points become homologous

logous Sides of the respective Sections, which are here to be considered as Figures returning into themselves at these Lines C x, cx. H z; hz. &c.

Cor. 7.

The Strength of Bones whether solid or hollow, whose transverse Sections are similar, must also be as the Squares of the Perimeters of their transverse Sections, and the Distances of their Centres of Gravity from their Centres of Revolution jointly.

For (*See Tab.* 1. *Fig.* 9 & 10. 11 & 12.) if the Areas of their transverse Sections are called Z^2, z^2, and the Distances of their Centres of Gravity from their Centres of Revolution are called D, d. $Z^2 : z^2 ::$ A Bq : abq :: BCq : bcq :: CDq : cdq :: DEq : deq :: EAq : eaq. Hence $Z : z ::$ AB : ab :: BC : bc :: CD : cd :: DE : de :: EA : ea :: AB+BC+CD+DE+EA : $ab+bc+cd+de+ea$ therefore $\overline{Z^2 : z^2 :: AB+BC+CD+DE+EAq}$ :: $\overline{ab+bc+cd+de+eaq}$; but the Strength of Bones has been demonstrated to be as $Z^2 : z^2 +$ as D : d, and consequently their Strength must also be as $\overline{AB+BC+CD+DE+EAq}$: $\overline{ab+bc+cd+de+eaq}$ + as D : d.

Scho-

Scholium.

From the like way of Reasoning it follows, that in hollow Bones their Strength shall also be as the Squares of the Perimeters of their Cavity measured on their transverse Sections.

For (*Fig.* 9, 10.) the Lines HI & *hi*. IF & *if*. FG & *fg*. GH & *gh*. may be conceived as homologous Sides of the respective Sections, which must here be considered as Figures recurring on themselves in the Lines H*z*, *hz*.

Cor. 8.

In comparing the Strength of Bones whose transverse Sections are similar, if right Lines are drawn from the Centres of Gravity of these Sections to similar Points of their Perimeters, (which we shall call similar *Radii* of Gravity) their Strength shall be as the Squares of these similar *Radii*, and the Distances of the Centres of Gravity of their transverse Sections from their Centres of Revolution jointly.

For in the Figures OBCDEABO, *obc a abo* (*See Fig.* 9 & 10. 11 & 12.) the Lnes Ob, *ob*, &c. drawn from their Centres

tres of Gravity O, *o*, to similar Points B, *b*, &c. may be conceived as homologous Sides of the respective Figures, which in this Case are to be considered as Figures returning into themselves at the Lines OB, *ob*, &c.

Cor. 9.

If the right Lines B*O*, *bo*, (*Fig.* 9 & 10, 11 & 12.) are produced to similar Points K & *k*, their Strength shall also be as the Squares of these Lines thus produced, that is, as the Squares of the Diameters of Gravity of the transverse Sections, and the Distances of the Centres of Gravity of the same Sections from their Centres of Revolution jointly.

This is demonstrated as *Cor.* 7.

Cor. 10.

The Strength of Bones, whose transverse Sections are similar, being by *Cor.* 8. as the Squares of the similar *Radii* of Gravity of these Sections, and the Distances of their Centres of Gravity from their Centres of Revolution jointly, it follows, that when they are to be broken similarly, or, in other Words, when the *Fulcrum* or Centre

tte of Revolution is placed in ſimilar Points of the Bones, their Strength ſhall be as the Cubes of the ſimilar *Radii* of Gravity of their tranſverſe Sections.

For in this Caſe the Diſtance of the Centres of Gravity from the Centres of Revolution coincides with ſimilar *Radii* of Gravity.

Cor. II.

The homologous Sides, Perimeters, and ſimilar Diameters of Gravity of ſimilar Figures being as their ſimilar *Radii* of Gravity, it follows, that when Bones of ſimilar tranſverſe Sections are to be broken ſimilarly, their Strength ſhall alſo be as the Cubes of the homologous Sides, the Cubes of the Perimeters, and the Cubes of the ſimilar Diameters of Gravity, of their tranſverſe Sections.

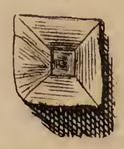
XI. *REMARKS on the Articulation, Muscles and Luxation of the* Lower Jaw, *by* ALEXANDER MONRO, *Professor of Anatomy in the University of* Edinburgh, *and* F. R. S.

e Supplements to this article, vid. vol. 3. p. 263.

THIS now near two Centuries since Anatomists have been universally acquainted with all the principal Parts belonging to the *lower Jaw*: They have known that the Condyles are covered with a smooth Cartilage; that the Jaw moves on these Processes which are received into a Cavity of each temporal Bone, immediately behind the Root of the zygomatic Process: And some have said that the Condyle of each Side moves on the Root of the *Zygoma*. Nor have they been ignorant of the oblong moveable Cartilage, which is concave in the Middle on both Sides, and is interposed between each Condyle and the temporal Bone with which it is articulated, nor of the Ligament that connects the Parts of this Articulation. They have likewise described eight Muscles that serve to raise the lower Jaw, and all the other Muscles

Tab: I

1



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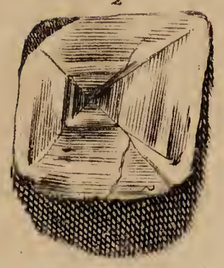

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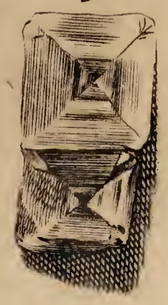

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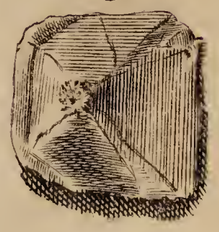

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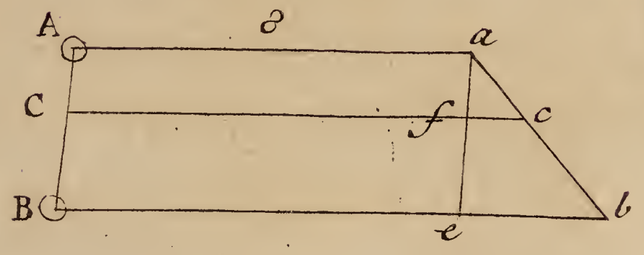

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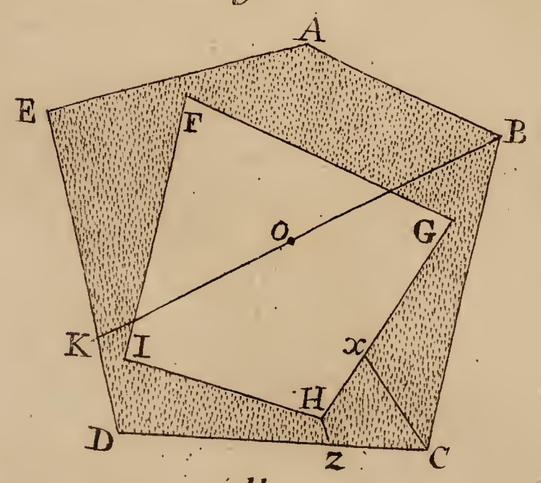

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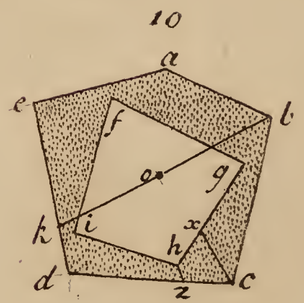

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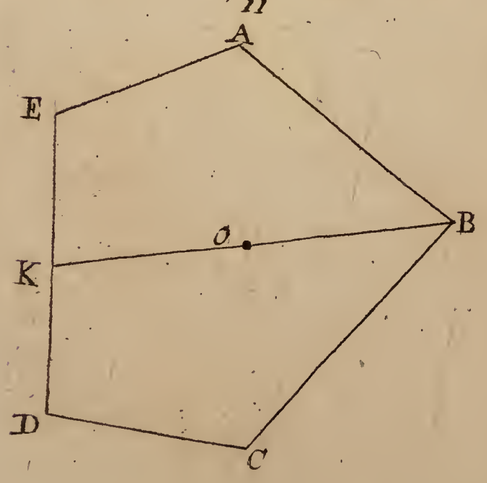

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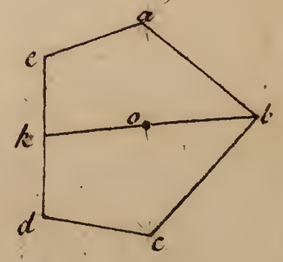

Muscles which are so fixed to this Bone as to be capable of pulling it down.

Tho' this Account seems to comprehend all the Parts that deserve to enter into a Description, yet I imagine the Mechanism of these Parts is not hitherto sufficiently explained, Authors having either overlooked some necessary Circumstances of the Structure, or observing too negligently the Actions and Motions performed here, and mistaking the proper Organs of them; I therefore submit to your Judgments to determine whether the following Remarks on the Articulation and Motion of the Condyles, and on the Actions of some of the Muscles of the lower Jaw, with a short Observation or two on the Luxation of that Bone, and the Manner of reducing it, deserve a Place in your Collection of *Medical Essays and Observations.*

Each Condyle of the lower Jaw is not articulated only with the Cavity behind the *Zygoma*, or only with the Root of that Process; but both the anterior Part of the Cavity, and the posterior Part of the Tubercle at the Root of the *Zygoma* are covered with smooth Cartilage for the Jaw to move on, and the Ligament of this Joint is fixed into the Circumference of these two Surfaces. The Share of the Cavity covered

red with Cartilage is ſmall, but the Ligament generally is ſpread over, and looſely connected by cellular Membranes to a larger Share of it backwards, and the large Part which ſtill remains behind this is filled externally with the *Parotid* Gland, which I have ſeen frequently reſemble at this Place the Glands commonly called *Conglobate* in its Firmneſs and Smoothneſs, but never could ſeparate this Part from the reſt of the Gland without Violence. In the remaining Share of the Cavity immediately before the *Styloid* Proceſs a fat cellular Subſtance is lodged.

The exterior Extremity of this oblong poſterior Cavity is made very narrow by the *Meatus auditorius externus* being conſiderably advanced forwards here, which again prevents the Condyle ever to be puſhed ſo far back as to be in Hazard of doing any Injury to the Gland ſituated in the more internal Part of the Cavity.

The Ligament which riſes from the Circumference of the ſmooth Surface of the temporal Bone is conſiderably long and wide, and is inſerted into the Edge of the concave moveable Cartilage; from which Edge another Ligament goes out to ſurround the Condyle of the Jaw, and to be inſerted into the Neck of that Bone: This

laſt

laſt Ligament is more tightly connected to the Cartilage and Bone than the former.

Each Condyle of the Jaw Bone ſtands with its greateſt Length tranſverſely, but with a ſmall Degree of Obliquity, the external Extremity being a little farther advanced forewards than the other. It is alſo worth while to obſerve, that the Convexity of this Proceſs is not perpendicular to the Neck of the Bone, but is almoſt turned entirely forwards, where it is covered with Cartilage for the Articulation, while the Neck, and poſterior Surface of the Condyle appear in one ſtraight flat Surface, with very little Cartilage covering the upper Part of it.

Into the anterior Edge of the moveable Cartilage interpoſed between each condyle and temporal Bone, a conſiderable Share of the *external Pterygoid* Muſcle is ſtrongly inſerted, and ſome few Fibres of the temporal and maſſeter Muſcles are alſo fixed to the external and ſuperior Part of this Cartilage. Dr. *Douglas* (*a*) is the only Author I know who has ſo much as hinted this Inſertion of theſe Muſcles.

For better underſtanding the preceeding Deſcriptions, I have herewith ſent you a Figure

(*a*) Myograph. Chap. 20. & Append. p. 3.

Figure repreſenting the Parts deſcribed in their natural Situation and Magnitude. See *Tab.* II.

When the Teeth of both Jaws are oppoſite, each to theſe of the ſame Claſs, the Condyles of the lower Jaw are, in moſt Men, placed in the Cavity of each temporal Bone; but as ſoon as the Teeth of the lower Jaw are advanced forward beyond the Range of the ſuperior, the Condyles deſcend on the Tubercles. This any one can be ſenſible of in himſelf, by laying his Fingers on the Angles of his own Jaw, while he performs theſe Motions; and it is obvious to the Sight when the Articulation is laid bare by Diſſection, and the Bone is moved in the Manner mentioned.

The Condyles can be moved laterally, when they are lodged in the Cavities, or on the Tubercles; but theſe lateral Motions are much more confined in the Cavities, becauſe of the ſurrounding Brims. Theſe Facts are to be examined in the ſame Way as the former.

The lateral Motions, and thoſe backwards and forewards of the lower Jaw, being exceedingly neceſſary for us in Chewing; this Mechaniſm of a double Sort of Articulation in a Cavitie, and on a Protuberance, anſwers the Deſign much more effectually

fectually than any one uniform Surface could have done, whether we ſuppoſe it plain, convex or concave; for in any of theſe, the Motion neither could have been ſo gradual, nor ſo ſteady, and at the ſame Time ſo free and large. But without the Interpoſition of a doubly concave Cartilage, the Motion of the Condyle on the Tubercle wou'd have been vacillating and often dangerous, ſeeing the two Convexities cou'd only touch each other in one ſtraight Line, and therefore the Condyle would have ſlid off, either back to the Cavity again, or forward to occaſion a Luxation; whereas the Cartilage, when placed on the Tubercle, renders the Surface on which the Condyle is to reſt really concave, and exactly fitted to the Convexity of that Proceſs. If however this Cartilage was to remain always in the ſame Situation in reſpect of the Condyle, it would be unneceſſary, if not inconvenient, when this Proceſs is lodged in the Cavity; therefore the Cartilage is never preſſed farther back than the poſterior Surface of the Tubercle, and there it receives the anterior convex Surface of the Condyle; but while the Cartilage is on the lower Part of the Tubercle, only the ſuperior ſtraight Part of the Condyle is joined to it. This is e-

vident on performing these Motions, after the Joint is laid bare, and part of the Ligament which goes between the Condyle and the moveable Cartilage is cut.

The Surface of both Condyle and Cartilage is so slippery, the anterior Edge of the Cartilage is so little prominent, and the anterior Part of the Ligament connecting the two is so loose, that the Pressure of the Condyle on the Cartilage would not be sufficient to bring the Cartilage as quickly forward as the Condyle, which however I have endeavoured to prove is necessary; to prevent therefore the Inconveniencies that might arise from the Condyle's being immediately contiguous to the Tubercle, some of the Muscles which serve to move the Condyle forwards, are also inserted into the Cartilage, and will equally advance both, and as the *external Pterygoid* Muscle has the most direct Action this Way, and indeed the largest Share in performing this Motion, it has the greatest Number of Fibres inserted into the Edge of the Cartilage.

If the Mouth was opened while the Condyle stands on the Tubercle, the flat back Part of the Condyle would be applied to the Cartilage, the anterior Prominence of which would consequently have little Effect, in pre-

preventing the Condyle to ſlip forward: So that if the leaſt Force was employed at the ſame Time to pull or puſh the Jaw forward, a Diſlocation would inevitably happen. To prevent which, the Muſcles that open the Mouth are ſo ſituated, that when they act, they muſt alſo pull the Jaw backward: Hence, when one attempts to open his Mouth, while the under Teeth are advanced beyond the upper, he immediately is ſenſible of the Jaw's ſliding back; and no Diſlocation does happen, without an external Force applied, unleſs when the Raiſers of the Jaw, by a convulſive Contraction, as in yawning, or violent vomiting, do forcibly keep the Jaw forwards, in the Time that the Depreſſors are acting.

All the Forces ſaid to be employed to bring the lower Jaw down in opening of the Mouth, are the Weight of the Jaw it ſelf, the Action of the *Platyſma Myoides*, and of the *Digaſtric* Muſcles; but as the two firſt are commonly allowed to be of little Account, Authors generally mention the *Digaſtric* Muſcles to be the ſole Antagoniſts to the eight Muſcles that raiſe the Jaw; which I have long ſuſpected to have been aſſumed without ſufficient Examination, there being ſome obvious Appearances that would ſeem to infer an Incapacity in

theſe *Digaſtric* Muſcles, to open the Mouth ſo wide, and with ſuch Force, as we really ſee it is; ſuch as,

1. The fleſhy Bellies of the *Digaſtric* Muſcles would appear too ſhort for performing ſuch a large Contraction, as is often required, whether we allow, according to the common Way of Reckoning, each fleſhy Fibre to contract $\frac{1}{3}$ of its Length, and ſtill leſs, if with *Bernouilli* (*a*) we reſtrict ſuch Contraction to $\frac{1}{5}$ of the Length of the Fibre.

2. The proportional Force of the *Digaſtricks* to that of the *Levators* of the Jaw, is conſiderably leſs than what is commonly obſerved in other Parts of the Body, where Antagoniſt Muſcles are; which proportional Force of theſe Muſcles, is on ſome Occaſions greatly leſſen'd by the Angle of Inſertion of theſe Digaſtrick Muſcles into the Jaw, decreaſing as the Mouth is opened.

Theſe Suſpicions made me to enquire more exactly into the Structure of the Parts, and to try ſome Experiments which ſeem all to contradict the common Opinion: For,

3. There is no Pully the leaſt a-kin to that of the larger oblique Muſcle of the Eye, thro'

(*a*) Act. Petropolit. Tom 1.

thro' which the Tendon of each Digaſtrick Muſcle paſſes; but what is commonly called the Ligament connecting the Tendon of the Digaſtrics to the *Os Hyoides*, is nothing elſe than part of the proper tendinous Fibres of the Digaſtrick Muſcle, ſent off from the reſt in Form of an *Aponeuroſis* (*a*), which is faſtned to the *Os Hyoides*, and is in part ſpread over the Inferior Extremity of the *Mylohyoideus* Muſcle, to be united to ſuch another *Aponeuroſis* of the other Side; and the Connection of this *Aponeuroſis*, as it comes off from the round Tendon is ſo firm, that the leaſt ſhufling or Motion of the round Tendon within this ligamentous Sheath, as it is commonly called, is not allowed: But this *Aponeuroſis* being of ſome Length, it can yield a little backward or forward when one or t'other of the fleſhy Bellies of the Digaſtrick Muſcle is ſhortned. Since then there is no Sheath in which the middle Tendon can ſlide, but that on the contrary it is connected to the *Os Hyoides*, we may ſee the Unfitneſs of the poſterior Heads of the two Digaſtrick Muſcles for pulling the Jaw down.

4. That we may have ocular Convicti-

(*a*) See Cowper's Myot. Tab. XXIII.

on of the poſterior Belly of the Digaſtrick having no Effect on the lower Jaw; let it be laid bare in a dead Body, whoſe Head muſt be reclined back for this Purpoſe, and then pull this Muſcle in the Direction of its Fibres, while the *Os Hyoides* is kept firm, or a little brought down (which this Bone evidently is, when the Mouth is opened) the Jaw will not in the leaſt be moved. If the *Os Hyoides* is left unfixed while the Muſcle is pulled, that Bone is brought upwards, till the two Heads of the Digaſtrick are brought to form a ſtraight Line, after which indeed the Force applied to the poſterior Belly of the Muſcle begins to depreſs the Jaw. But as the firſt Caſe of the *Os Hyoides* being kept firm, is the only ſuppoſition to be allowed in the preſent Queſtion; I preſume this Concluſion from the forgoing Obſervations, will ſcarce be refuſed. That the common Account of the Action of the *Digaſtrick* Muſcles is not altogether ſo unexceptionable as it has hitherto paſſed for.

Having undone the Mechaniſm of a Pulley, thro' which the middle Tendon of each *Digaſtrick* is ſaid to paſs; and having excluded the poſterior Head of that Muſcle from its Office of pulling the Jaw-bone down; I am almoſt induced to think, that

in

in the ordinary Depreſſions of the lower Jaw, the anterior Bellies of the *Digaſtrick* Muſcles are as little employed as the poſterior. For,

5. When the two Extremities of this anterior Head are pulled towards the Middle, by the Help of a Thread paſſed through the firm tendinous Part near each Extremity, the Ends of which are croſſed and equally drawn in the Direction of the Fibres, which is the faireſt Way of knowing the Action of any Muſcle both whoſe Extremities are moveable; when, I ſay, the anterior Head of the Digaſtric Muſcle is pulled in this Manner, we obſerve the tendinous *Aponeuroſis* yield near as much forwards, as one would expect the natural Contraction of this fleſhy Belly would require. When the *Aponeuroſis* is fully ſtretched, the *Os Hyoides* is brought upwards, and then the Jaw-bone is pulled down. If the *Os Hyoides* is kept firm, while this Muſcle is thus drawn, its Effects on the lower Jaw will be greater and more obſervable. And if the poſterior Head is alſo pulled at the ſame Time, the whole Effort of the Force wherewith the anterior Belly is drawn, is employed in opening the Mouth. From which it would appear, that in order to apply the Power of this anterior muſcular

Head to the Jaw-bone, it is neceſſary to ſuppoſe the poſterior Belly to act at the ſame Time with it, that the *Aponeuroſis* may be kept ſtretched, which is all the Service this poſterior Head does; and in performing this, it muſt exert a Force equal to the Contraction of the anterior Belly; and that Force muſt be employed in the Direction of its muſcular Fibres on the *Os Hyoides*, and therefore muſt counteract the Muſcles which pull the *Os Hyoides* down; but I ſhall afterwards prove that the Action of theſe laſt Muſcles is conſtant and neceſſary in opening of the Mouth, conſequently the Jaw gains nothing on this Suppoſition of the anterior Belly of the *Digaſtrick* aſſiſting the Depreſſion of it, ſince an equal Power is loſt by the Action of the poſterior Head. From all which there is at leaſt a ſeeming Improbability of any Part of the Digaſtrick Muſcle acting in the Depreſſion of the Jaw, when nothing is to be gained by it.

6. To confirm what has been argued for in the preceeding Paragraph, let any one whoſe *Tunica Celluloſa* is not too well filled, apply his Fingers to the Teguments that cover the anterior Heads of the Digaſtrick Muſcles, while the Mouth is opened ever ſo wide quickly or ſtrongly, he will

will indeed feel theſe Muſcles protruded a little outwards, by the ſwelling of thoſe above them; but will not beſenſible of their becoming either harder or ſhorter, which however is plainly to be felt at this ſame Time in much thinner Muſcles, the *Sternohyoidei* and *Sternothyroidei*, by placing another Finger on the fore-part of the *Trachæa arteria*; and is manifeſt in theſe ſame anterior Heads of the Digaſtricks, when Deglutition is performed.

The Office I wou'd aſſign to the *Digaſtrick* Muſcles is to be principal Inſtruments in the compound Action of Deglutition, one part of which they are exceedingly well adapted to perform, which is to pull the *Os Hyoides* upwards, and thereby to preſs the Root of the Tongue, *&c.* to the *Velum pendulum Palati*; for which Purpoſe the only Organs commonly mentioned, the *Stylo-hyoidei*, *Stylo-gloſſi* and perhaps the *Stylo-pharyngei* Muſcles, are too weak, conſidering the Reſiſtance they muſt meet with, in raiſing ſo many Parts *viz.* the Tongue, *Os Hyoides*, *Larynx*, &c. whoſe Muſcles are to be ſtretched far beyond their natural Tone. The Fitneſs of theſe Digaſtricks for ſuch an Office is pretty evident from a View of theſe Muſcles in their natural Situation, and only applying the univer-

ſally

ſally acknowledged Effort of all Muſcles, to bring themſelves in their Contractions from a crooked to a ſtraight State. For further Evidence, let both Heads of either one or both Digaſtrick Muſcles be pulled in the Manner formerly mentioned, and the Raiſing of the *Os Hyoides* will be ſeen: Or what may perhaps be as convincing, let any one ſwallow either Solids or Fluids, while his Fingers are applied below his Chin, and he will feel the Swelling, Hardneſs and Shortning of theſe Muſcles then in Action.

This being granted to be the proper Action of the two Digaſtricks, we may readily aſſign ſeveral Reaſons why one can ſcarce ſwallow any with his Mouth open: *Firſt*, The lower Jaw being then unſtable and moving, theſe Muſcles have not ſuch a fixed Point to reſiſt their Actions. *Next*, The Jaw and *Os Hyoides* being brought nearer, the Curve made by the Tendon of each Digaſtrick Muſcle muſt be diminiſhed, conſequently the Effect the Muſcle would have on the *Os Hyoides* is alſo leſſened, whereas it ought rather to have been increaſed, becauſe the Space between the *Velum pendulum Palati* and the *Os Hyoides* is increaſed, by this Bone's being brought down at this Time. *Laſtly*, The Muſcles which ſerve to draw down the *Os Hyoides* being

being now in Contraction, they muſt prevent the Action of the *Digaſtrici*.

We may here alſo obſerve how advantageouſly the tendinous *Aponeuroſes* of the Digaſtrick Muſcles are ſtretched over the *Mylohyoidei* Muſcles, for raiſing the Root of the Tongue along with the *Os Hyoides*; and how the *Stylohyoidei* and *Digaſtrick* Muſcles may act more uniformly and in a more convenient Direction, by the Tendons of the latter paſſing through the Subſtance of the former.

I come now to ſupply the Function which I have endeavoured to deprive the Digaſtrick Muſcles of; but muſt previouſly remark that the Opening of the Mouth does not only depend on the Motion of the lower Jaw downwards, but alſo on the ſuperior Jaw being raiſed up by the Muſcles which extend the Head back: This Fact is ſtrongly denied by the Generality of Anatomiſts, and really paſſed unobſerved by me, till my ingenious Friend and *quondam* Pupil, Dr. *John Pringle* made me remark it; and any one may convince himſelf of the Truth of it, by putting the Blade of a Knife or his own Nail oppoſite to the conjoined Edges of the Teeth when the Mouth is ſhut; which Knife being held unmoved while the Mouth is opened, he may,

by

by the Help of a Mirrour, ſee the upper Teeth raiſed remarkably at every Aperture he performs. The larger Share however of the Mouth's Aperture is, in the ordinary erect Poſition of the Head, made by the lower Jaw's being brought down by Muſcles that are commonly appropriated to the Tongue, *Os Hyoides* and *Larynx*, which are capable in my Opinion of being applied not only to this Uſe, but to ſome others that are generally overlooked.

In conſidering theſe Muſcles in reſpect of the lower Jaw, imagine the *Sterno-hyoidei* and *Genio-hyoidei*, or the *Coraco-hyoidei* and *Mylo-hyoidei* to act at the ſame Time; it is evident that the *Sternum* and *Scapula* being fixed in Compariſon of the Jaw, theſe Muſcles may be looked on as Digaſtricks, whoſe middle Interſection is the *Os Hyoides*, and whoſe moveable Inſertion is the lower Jaw. Imagine in the ſame Manner the *Sterno-thyroidei*, *Thyro-hyoidei*, *Hyoglooſſi* and *Genioglooſſi* to act altogether, they may be conſidered as two many-bellied Muſcles acting on the lower Jaw, which they will be ſufficient Depreſſors of, in Length, Strength and Manner of Inſertion, without ſtanding in need of Aſſiſtance from any other Muſcles. Beſides what might reaſonably be deduced from viewing

theſe

theſe Muſcles, and from pulling them in the Direction of their Fibres in a dead Body, in Proof of their being employed in depreſſing the Jaw, we can be abundantly ſenſible of moſt of them acting when the Mouth is opened, by laying our Fingers on the Teguments that cover them.

Theſe Muſcles do, by the Jaw's deſcending, loſe ſomewhat of the advantageous Inſertion which they have when the Mouth is ſhut, for the *Os Hyoides* will deſcend ſo much leſs than the Jaw-bone, as the Contraction of the Muſcles ſituated below the *Os Hyoides* is leſs than the joint Contraction of theſe Muſcles and of the others that go from that Bone to the Jaw: To mention an Example, ſuppoſe the *Sterno-hyoidei* and *Genio-hyoidei* only to act, the Chin will be brought proportionally ſo much farther down than the *Os Hyoides* deſcends, as the Quantity of Contraction of both *Sterno-hyoidei* and *Genio-hyoidei* is greater than the Contraction of the *Sterno-hyoidei* alone; in conſequence then of the Chin being brought nearer to the *Os Hyoides*, the Muſcles between theſe two Bones come to have a more oblique Direction to the Jaw, or to have their Angles of Inſertion diminiſhed, and their Force in pulling the Jaw down on that Account leſſened: One Advantage

vantage however is hereby obtained, that the Root of the Tongue, *Larynx*, *&c.* are not removed too far out of their Place; and that Loſs of advantageous Inſertion is compenſated another Way; for when the Muſcles above and below the *Os Hyoides* are conſidered as *Digaſtricks*, it is evident that this Bone being placed farther back than the Inſertion of the Muſcles into the Jaw, a conſiderable Curve muſt be made at the bony Interſection of theſe Muſcles, and therefore by becoming ſtraighter in their Contraction, they muſt draw the *Os Hyoides* forward, by which this Bone becomes more perpendicular to the Jaw, and the Muſcles obtain neceſſarily a more favourable Direction. But in all Poſitions of the *Os Hyoides* in reſpect of the Jaw, the Obliquity of the Muſcles backward is great enough to oblige the Condyles of the lower Jaw, when advanced on the Tubercles, to ſlide back into the Cavities in the Time of their Action, by which, as I hinted formerly, Luxations are prevented.

This Motion of the *Os Hyoides* forwards and downwards, which can be felt by laying a Finger on this Bone when the Mouth is opened, leads us naturally to account for the Uſe of the Ligament which is ſent out from the *Styloid* Proceſs of each temporal Bone

Bone to be fixed to each *Appendix* of the *Os Hyoides*; for its Direction is exactly ſuch as prevents this Bone to be drawn too far out of its Place by the Muſcles that open the Mouth, whereas it can be of little Effect towards ſupporting the *Os Hyoides* and other Parts connected to it, unleſs it had been more perpendicular: I imagine the Reſiſtance which theſe Ligaments make to the Muſcles below the *Os Hyoides* to be one Reaſon why theſe Muſcles do not bring the *Os Hyoides* ſo far down proportionally to their Lengths, as the others above it ſeem to depreſs the Jaw, in opening the Mouth. Which Action I found to be performed by the ſeveral Parts concerned in the following Proportion; by ſtraining I can open my Mouth, when the Head is in the moſt natural eaſy Poſition, till the Diſtance between my anterior *Dentes Inciſores* is 1½ Inch, to which the Extenſor Muſcles of the Head contributed ſomewhat leſs than half an Inch by raiſing the upper Jaw, the *Os Hyoides* deſcended about as much more than half an Inch as the upper Jaw wanted of it, and conſequently the Muſcles between the lower Jaw and *Os Hyoides* contracted one third of the whole Space; I choſe this ſtraining Poſture, becauſe any other Degree of opening the Mouth cannot well

well be determined; but I am at the ſame Time ſenſible that where no ſuch violent Contraction of Muſcles is required, the proportional Motions of theſe Parts will be different from what I have juſt now deſcribed them; and when the Head is extended very far back, the lower Jaw only is moved in opening the Mouth, whereas this Action is chiefly performed by raiſing the upper Jaw when the Head is bended much forward.

Suppoſing then the *Mylo-hyoidei*, *Genio-hyoidei*, *Genio-gloſſi*, *Hyo-gloſſi*, *Sterno-hyoidei*, *Coraco-hyoidei*, *Thyro-hyoidei* and *Sterno-thyroidei* Muſcles always to be employed in drawing down the Jaw conjunctly, (whereof however in ordinary Occaſions ſome may be unactive) the Force they are capable of exerting will be conſiderably leſs than that of the *Levators*. From hence we may learn how the whole Parts being left to their natural Action, the lower Jaw may be ſupported and the Mouth kept ſhut by the ſuperior Power in the *Levators*; whereas the *Depreſſors* in their voluntary Contraction (which is vaſtly greater in all Muſcles than the natural) may be capable of overcoming the natural Force of the *Levators*: Hence alſo we may ſee the Reaſon of the Jaw's falling down by its own

Weight

Weight when the natural Contraction of all the Muſcles is weakened by Palſy, Drunkenneſs or Sleep; or how, on the contrary, the Mouth is violently kept ſhut, when the Muſcles are preternaturally contracted, as in Convulſions, Inflammations, &c.

Theſe Muſcles which are ſo well adapted for depreſſing the lower Jaw, are capable of performing very different Functions when the lower Jaw is kept firm by the Muſcles which raiſe it: If they act at different times, the moſt remarkable of their Actions will be theſe; The *Genio-gloſſi*, *Hyo-gloſſi*, *Genio-hyoidei* and *Mylo-hyoidei* will pull the *Os Hyoides* and Tongue upwards and forwards. If with theſe the *Thyro-hyoidei* act the *Larynx* will alſo be brought along with the other Parts; If with all yet mentioned the *Sterno-hyoidei* and *Coraco-hyoidei* act, the *Larynx* only will be brought nearer to the *Os Hyoides*. If the *Thyro-hyoidei* alone act, the *Os Hyoides* and *thyroid* Cartilage will approach each other proportionally to their Mobility. If the *Sterno-hyoidei* and *Coraco-hyoidei* act with the former, the *Os Hyoides* will deſcend to the Cartilage. If to theſe the *Sterno-thyroidei* are joined, then the Tongue, *Os Hyoides* and *Larynx* will be brought down. All the other combined Actions of

theſe Parts are eaſily deducible from theſe mentioned. If theſe Muſcles act all together, and the Jaw is kept firm at the ſame time by its *Levators*, they have an Effect not ſo generally remarked, which is the Bending of the Head forward, the Articulations of the Head and of the ſuperior *Vertebræ* being the neareſt moveable Joints; and in this Action theſe Muſcles muſt have very great Advantage by the great Diſtance of their Inſertion from the Centre of Motion, or in other Words, by the Length of the *Vectis* they act with: As an Evidence of the Fact, let any one's Head be pulled or puſhed violently backward, his Jaws are preſſed ſtrongly together, and his Throat is tenſe with his *Larynx* advanced, while he ſtrains to reſiſt the Force applied: This the Painters ſeem to have been abundantly more ſenſible of than the Anatomiſts.

The Sum of all I have argued for concerning theſe Muſcles may be deduced in theſe few Propoſitions.

The *Digaſtrick* Muſcles ſerve to draw up the *Os Hyoides* and Parts annexed to it in Deglutition.

In opening the Mouth the Head is extended, and the whole Muſcles of any conſiderable Length and Bigneſs ſituated betwixt the *Sternum* and Chin (except the

Diga-

Digaſtrici) are put into Action; the *Os Hyoides*, *&c.* are drawn down and advanced forward; if the Jaw-bone was brought forward it is made to ſlide back.

When the Mouth is kept ſhut, or the Jaw-bone is made firm by its *Levators* in any Degree of the Aperture of the Mouth, that Range of Muſcles juſt now mentioned may either contract ſucceſſively, and then they act as commonly deſcribed, unleſs that by being variouſly combined they may be differently determined to pull up one Part or to depreſs another: Or if all the Muſcles act together, they conſpire to bend the Head forward.

When the Condyles of the lower Jaw are luxated the Mouth ſtands open and cannot be ſhut; this Mr. *Petit* (*a*) aſcribes to the Direction of the Fibres of the Muſcles that raiſe this Bone, being ſo altered in reſpect of the Condyles, that theſe Proceſſes come to be ſituated in a ſtraight Line drawn from the Origin to the Inſertion of the Muſcles, and therefore theſe Muſcles can have no other Effect than to preſs the Condyles cloſer to the temporal Bones; it is evident however that this cannot obtain in moſt of theſe Muſcles, as for Inſtance, in the *Maſ-*

(*a*) Maladies des Os Liv. 1. Chap. 3.

ſeter and *internal Pterygoid*, nay, the *external Pterygoid* would ſeem to gain as much more in this morbid Situation as the *Temporal* loſe, and I have ſeen People labouring under a Luxation of the lower Jaw whoſe Mouth ſtood open to a certain Degree, but they could ſtill open it farther, and bring it back again by the Elevator Muſcles of the Jaw. The plain Cauſe of the Mouth's not ſhutting in the Luxation is the ſlipping of the Coronoid Proceſſes under the anterior Root of the *Zygoma*, and their being preſſed on that Bone; which is I ſuppoſe one Reaſon why, after attempting the Reduction of ſuch a Luxation, by ſimply preſſing or ſtriking the fore Part of the Jaw upwards, or after applying any other Force that preſſes the Coronoid Proceſſes violently upon the Bones of the upper Jaw, a Tenſion and Inflammation may be brought on the Parts hereabouts, and particularly on the Temporal Muſcles, which afterwards may be followed by all the other Symptoms of a pricked, bruiſed or wounded Tendon taken Notice of by *Hippocrates*, becauſe the Tendon of the Temporal Muſcle of the luxated Side muſt ſuffer theſe very Injuries, by being intercepted betwixt the *Corone* and the *Os Maxillare* or *Malarum*.

This

This Cauſe of the Mouth's remaining open in a Luxation which I have aſſigned, was the common Reaſon given for it before Mr. *Petit*, and is ſtrenuouſly defended by one of his Criticks (*a*), therefore I need not have mentioned it, if Mr. *Petit*'s Book was not in the Hands of a great many young Students here, and the other known to few; and I hope the other Circumſtances added, which are at leaſt not ſo commonly remarked, will plead my Excuſe.

I have more than once found Mr. *Petit*'s Method of reducing the luxated Jaw-bone ineffectual, after the Muſcles had been ſwelled by unartful Attempts of Reduction, but have ſucceeded by a very ſmall Improvement on that excellent Method, which was, to wrap Linnen ſo thick round my two Thumbs, that I could ſcarce introduce them betwixt the poſterior Grinders; then taking Hold of the Baſe of the Jaw with my Fingers, and applying my Palms under the Chin, I preſſed down and pulled forward the poſterior Part of the Jaw with my Fingers and the Points of my Thumbs, which is the whole of Mr. *Petit*'s Method; and at the ſame time I thruſt the anterior Part of the Jaw upwards with my Palms,

(*a*) Diſſertation au Sujet des Ouvrages de l'Auteur du Livre ſur les Maladies des Os.

ſo that the Jaw being made Uſe of as a Lever to which the laſt Joint of the Thumbs ſerved as a Prop, I acquired a conſiderable additional Force to which the Muſcles were obliged to yield, and the Condyles were diſengaged intirely from the *Zygoma*, and brought down, after which they ſlide backwards with the leaſt Aſſiſtance, and the Reduction is fully made.

The Origin and Courſe of the *CHORDA TYMPANI* being deſcribed by few Authors, and ſcarce delineated by any in the natural Poſition, and the Figure eaſily admitting of the Repreſentation of the *inferior maxillary* Branch of the fifth Pair of Nerves as it comes out of the Skull and divides into its Branches, I have cauſed paint that Nerve and the *Chorda Tympani*, which I ſhall ſay with the Generality of Anatomiſts proceeds or is ſent off from that Nerve, tho' I rather incline to think it a Branch of the *Portio Dura* of the ſeventh Pair united to the fifth: The *Chorda Tympani* takes its Origin moſt frequently from that Branch of the fifth Pair that is beſtowed on the Tongue, but I have ſeen it ſometimes riſe from the Trunk which furniſhes the Branch given to the Tongue and the other that enters the poſterior Hole of the lower Jaw. The *Chorda* immediately after its Riſe runs back-

backwards and outwards involved in a cellular Subſtance, till it ſinks within the bony Part of the *Tuba Euſtachiana*; The Situation of the Skull in drawing this Figure would not allow me to delineate more of this *Chord*, without deſtroying ſome Parts that were chiefly deſigned to be illuſtrated here, wherefore I ſhall refer to *Tab.* xiii. and vii. of *Du Verney*'s *Traitè de l' Organe de l'ouie* for what remains of it; and ſeeing our common Syſtems, nay the Authors who have expreſly treated of the Nerves paſs the Deſcription of this Nerve generally very ſlightly, I ſhall tranſlate Mr. *Du Verney*'s Deſcription, which is the fulleſt and moſt exact I know.

" The little Nerve (*ſays he, Pag.* 51.) " that croſſes the *Tympanum*, has its Ori- " gin immediately from the Branch of the " fifth Pair of Nerves which deſcends to " be diſtributed to the Side of the Tongue; " this little Nerve aſcends to the exterior " Side of the bony Part of the *Tuba Eu-* " *ſtachiana*, and following the Courſe of " the *external* (commonly called now the " *oblique*) Muſcle of the *Malleus* over " which it lies, it enters by the ſame A- " perture into the *Tympanum*; then it paſ- " ſes under the Tendon of the *internal* " Muſcle, and deſcending obliquely from

" before backwards, it lies upon the Mem-
" brane of the *Tympanum*, and passing be-
" fore the long Leg of the *Incus*, it at last
" escapes out of the Cavity of the *Tympa-*
" *num*, to enter into a small Canal formed
" in the *Os Petrosum*, and is joined to the
" *Portio Dura* of the Auditory Nerve a
" little before the *Portio Dura* makes its
" Exit from its Canal."

The only Remark I have to make on this Description is, That I am at a Loss how to understand the Words *It lies upon the Membrana Tympani* (*a*), for it does not appear to be immediately contiguous to that Membrane.

I have also caused represent the *Tubæ Eustachianæ* in this Figure, in full View, that one by supplying in his Imagination the *Velum pendulum Palati* and *Uvula* depending obliquely from the Edge of the Palate Bones, or by consulting *Du Verney*'s *Tab.* ix. *Fig.* 2. may easily understand the true Situation of the Orifices of the *Tubæ*, which some Anatomists seem not to be intirely well acquainted with, tho' it is an anatomical Fact necessary to be exactly understood, especially if it shall be found that the Method of injecting Medicines by this Canal

(*a*) Il se couche sur la Peau du Tambour.

nal for curing Deafneſs in ſeveral Caſes ſhall prove ſucceſsful, which there is a great Probability it ſhould; and of which Mr. *Guyot* gives a good Inſtance by relating his own Cure (*a*): The Inſtrument he made Uſe of for injecting the Medicines is deſcribed at great Length by Mr. *Garengeot* in his Treatiſe of *Chirurgical Inſtruments*.

By Authors neglecting to explain the Method they took to repreſent the Parts delineated in their Figures diſengaged from all the others to which they are naturally contiguous and adherent in the Body, I have often obſerved younger Anatomiſts utterly at a Loſs to ſearch out the Parts which they imagined they underſtood exactly the Situation and Structure of from the Repreſentation Authors had made of them; to prevent ſuch an Inconvenience in the preſent Caſe, allow me to inform your Readers how the Bones appear ſo bare, and yet the ſofter Parts which were deſigned to be repreſented are preſerved intire.

Mr. *Cooper*, who both drew and engraved the following Figure, not having been formerly in Uſe to work on anatomical Subjects, I put a Skull perfectly cleaned in the proper Attitude, and let him draw it at his

(*a*) Hiſt. de l'Acad. des Sciences 1724.

his Leiſure; then I cauſed him ſupply the other Parts painted from the firſt recent Subject I had afterwards, whoſe Skull was very near the ſame Dimenſions, having previouſly made the Bones as bare as I could without boiling or macerating, and without injuring the ſoft Parts deſigned to be illuſtrated, which Method has had a good Effect, by making the whole Figure more ſimple and beautiful.

Explication of Table II.

A. The Occipital Bone.
B. B. The Lambdoid Suture.
C. The great Hole of the Occipital Bone through which the *Medulla Spinalis* paſſes.
D. D. The Condyles of the *Os Occipitis*.
E. E. The Maſtoid Proceſſes of the temporal Bones.
F. F. The Styloid Proceſſes.
G. G. The Zygomatick Proceſſes.
H. H. The Holes through which the lateral Sinuſes and eight Pair of Nerves paſs.
I. I. The Paſſages of the Carotid Arteries.
K. K. The external Wings of the pterygoid

goid Proceſſes of the ſphenoid Bone.

L. L. The internal *Alæ*.

M. M. The external Ears.

N. The left temporal Proceſs of the ſphenoid Bone.

O. The Back-part of the *Vomer*.

P. P. The Part of the Parotid Glands lodged in the Back-part of the Cavities which receive the Condyles of the lower Jaw.

Q. Q. The *Tubæ Euſtachianæ*.

a. The Tubercle of the left temporal Bone on which the Condyle of the lower Jaw moves when the *Maxilla* is drawn forwards.

b. The Cavity behind that Tubercle wherein the Condyle is commonly lodged. The ſurrounding Ligaments hinder this Cavity to be fully repreſented.

c. The Ligament which connects the moveable Cartilage to the temporal Bone.

d. The moveable Cartilage of the right Side brought forwards on the Tubercle that it might be fully ſeen.

e. The circular Ligament which connects the Cartilage to the Condyle of the Jaw.

f. That

f. That Part of the *external pterygoid* Muscle which is inserted into the moveable Cartilage and serves to pull it forwards.

g. g. The third Branch of the fifth Pair of Nerves coming out of the Skull.

h. h. The Branches of that Nerve given to the temporal and masseter Muscles.

i. i. The *Chorda Tympani* sent off from the Branch of that Nerve which is distributed to the Tongue.

XII. *An ESSAY on the alternate Motions of the* Thorax *and* Lungs *in Respiration, by Dr.* GEORGE MARTINE, *Physician at St.* Andrews.

NO complete Theory of Respiration has been yet sufficiently explained and fully established: After all the ingenious Contemplations and Experiments of Philosophers anent the Properties of the Air; after all the most curious Researches of Anatomists, and the careful Observations of Physicians about the Fabrick, Uses and Diseases of the Parts concerned, there are still left many Difficulties, which I am far from pre-

Tab: II

Ad vivum del. & sculp. R. Cooper.

pretending to remove; much has been wrote, many have been the Diſputes about *the primary Uſe of Reſpiration*, about *the Paſſage of the Blood through the Lungs*, about *the Influence of the inſpired Air upon the Blood*, *&c.* But all theſe being laid aſide at preſent, I ſhall only conſider *the Mechaniſm whereby in ordinary Life Exſpiration and Inſpiration ſucceed one another alternately.*

2. You will not be ſatisfied with *Swammerdam*'s (*a*) telling you in general, That theſe Muſcles, which are not exactly ballanced by equally ſtrong Antagoniſts, muſt neceſſarily be contracted and relaxed by Turns; as in the Motions of the Ventricles and Auricles of the Heart, of the reſpiratory Muſcles, of the Antagoniſts of wounded or paralytick Muſcles, *&c.*

He does not offer at explaining the Mechaniſm of the alternate Contraction and Relaxation of the Muſcles in ſuch Motions, which is the Point in Queſtion; nor is it probable that all theſe very different Motions are to be explained by any one uniform Principle.

3. Nor will you think *Borelli* (*b*) has given a perfect Solution of the Problem, by ſaying,

(*a*) De Reſp. p. 67. & Poſ. Inaug. § 8, 9. (*b*) De Mot. Anim. II, 117.

ſaying, That after once Reſpiration is begun, the Animal, from the Good it feels by it, is neceſſarily determined to continue the ſame all its Life afterwards.

We allow the Neceſſity of Reſpiration; we know it ſerves for many noble Purpoſes: But ſtill we are at a Loſs to underſtand by what natural Mechaniſm Exſpiration and Inſpiration neceſſarily continue to ſucceed one another by Turns.

4. We cannot omit to remark, that the great *Bellini* thought himſelf Maſter of this difficult Queſtion, as of almoſt every thing elſe relating to the Nature and Fabrick of Animals. In the Beginning of his *Opus medicum de urinis*, &c. he lays down ſeveral very pretty phyſiological Propoſitions; among which is this "(*a*) *Contractis ſemel* "*muſculis pectoris, per totum vitæ ſpati-* "*um reſpiret animal neceſſe eſt, iidem ſci-* "*licet muſculi per univerſum illud tempus* "*alterne reſtituantur & contrahantur.*" This he gives us, without any Illuſtration or Proof; and I fear we ſhall never hear more of that great Man's Thoughts on this Subject. Nor does his Friend, our worthy Countryman Dr. *Pitcairn*, (who wrote his Diſſertation *de cauſis diverſæ molis quæ fluit*

(*a*) De Reſp. § 18.

fluit sanguis per pulmones, &c. chiefly to illustrate *Bellini*) supply this Want, or at all answer our Wishes or Expectation. He tells (*a*) us, after *Swammerdam*, That Muscles without Antagonists, such as he conceives the inspiratory Muscles to be, must necessarily be contracted and relaxed alternately; and that, by the alternate influx of the animal Spirits through the Nerves into them, proceeding from the alternate Compression of the Brain, by the Pulsation of its Arteries.

But, laying aside those Reasons which induce some (*b*) to think the natural Motion of the Liquor of the Nerves to be very uniform; if Dr. *Pitcairn*'s Solution of the alternate Dilatation and Contraction of the *Thorax* were true, I cannot see but that they should always correspond, and be isochronous to the Pulses of the Heart and Arteries, which every Body knows to be false in Fact. Yea, though we should allow them in many Cases to correspond in some Measure, yet Dr. *Harvey* (*c*) has well observed, That the Pulse and Respiration do

(*a*) De Caus. div. mol. &c. § 16. El. Med. 1, 5. § 70. (*b*) Boerh. Instit. Med. § 288. (*c*) De Mot. Cord. Proœm. p. 15.

do sometimes suffer Changes of Frequency, directly contrary to one another.

5. This Consideration does likeways, I humbly think very much invalidate the Way wherein the judicious and accurate *Boerhaave* chuseth to explain the alternate Motions of Respiration. He supposes (*a*), That at the End of Inspiration, the Lungs being stuffed with Air, and every Way compressed, the free Passage of the Blood towards the left Ventricle of the Heart, is somewhat obstructed; and consequently a smaller Quantity is carried to the inspiratory Muscles of the Chest, and a weaker Circulation towards the *Cerebellum* and its Nerves, which are supposed to actuate these Muscles: So that the inspiratory Organs being weakned, Exspiration must of Necessity succeed by the natural Restitution of the *Compages* of the *Thorax* and *Abdomen*; whence the Blood, passing again more freely through the Lungs to the left Ventricle, will be more plentifully bestowed upon the *Cerebellum*, and these inspiratory Muscles, which then must of their own accord immediately dilate the Cavity of the Breast, or produce Inspiration, which Exspiration does necessarily succeed, and so on.

But

(*a*) Instit. Med. § 619. 620.

But, beſides the Diſſonance of the Motion of the Heart and *Thorax* juſt now mentioned, I believe it will be difficult to perſuade us that the Diaphragm and intercoſtal Muſcles ceaſe to contract for Want of a ſufficient Store of Blood furniſhed to the left Ventricle of the Heart, or for Want of Spirits furniſhed to the *Cerebellum* and the vital Nerves. Would not, upon the ſame Account, all the other Muſcles, whether voluntary or involuntary, and the Brain it ſelf, and all the Nerves of Senſe and Motion, alternately ſuffer ſome Failure (ἔκλειψιν) at the End of every Inſpiration, from the diminiſhed Quantity of Blood ſupplied to the left Ventricle, and thence to the reſt of the Body? Is not the beating of the Heart and Arteries equally full, equally ſtrong, and equally frequent at all the different Moments of Reſpiration? which plainly ſhows, that in a ſound State the Heart never wants Blood, nor the *Cerebellum* Spirits to furniſh the Organs that depend upon them: So that the inſpiratory Muſcles, which are ſuppoſed to be vaſtly ſtronger than their Antagoniſts, would always remain rigid and contracted, if there were not ſome other Way provided to ſuſpend alternately the Cauſe of their Contraction.

6. Seeing then these so very great Men had made their Attempts with so little Success, I gave over Thoughts of so much as an Approach to any true and just Account of a Phænomenon so obvious, but so difficult to be explained; until at length meditating upon the Rise and singular Course of the Nerves of the Diaphragm, I thought I could perceive a Necessity of their being alternately compressed, and again set at Liberty, so as to produce an alternate Contraction and Relaxation of that Muscle.

Every Body allows that it is the chief Organ of ordinary and natural Respiration, since from the swelling of the Belly, we find the Enlargement of the Cavity of the Breast is more owing to the Depression of the Midriff, than to any remarkable Change in the Posture of the *Sternum* and Ribs. Now let us trace as far as we can, and admire the adorable Wisdom and Contrivance of our great Creator. He has not provided the Midriff with Nerves from the Trunks nearest it, either from the *par vagum*, or that which is called *Intercostal*, or the Spinals of the *Thorax* or Loins next to it: No, he has brought Nerves to it from afar, and conveyed them a long Course through the Cavity of the Breast: For the *Phrenicks*, tho' they should not be allowed

ed in all Subjects to be made up preciſely of the ſame Twigs, yet Anatomiſts have always found their chief Origin from the middle cervical Nerves. And I think we need not mind *Vieuſſens*'s (*a*) ſmall Filaments from the intercoſtal or firſt Lumbars; or *Columbus*'s (*b*) from the laſt thoracick given to the Diaphragm. Much leſs are we to regard any Branches of the eighth Pair ſaid to be diſtributed to it by ſome of the Ancients; ſince *Galen* (*c*) aſſures us it has not the leaſt Twig from thence. Why then has Nature been ſo ſollicitous in giving the principal Diaphragmatick Nerves ſuch a far-fetch'd Origine, and carrying them ſuch a long Courſe? If you ſhall once perceive her Deſign in this, I am hopeful you ſhall with Pleaſure comprehend the alternate Motion of Reſpiration, as far at leaſt as it depends upon the Motion of the Diaphragm.

7. Firſt then we are to conceive the external Air gravitating equally *undequaque*, by its Weight and Fluidity; and therefore preſſing upon the hollow Surfaces of all the pulmonary Veſicles, and conſequently upon the Membrane inveſting the Lungs, and incloſing all theſe Veſicles;

(*a*) Neurogr. T. xxiii. 58. T. xxviii. 1. (*b*) De re Anat. viii. 6. (*c*) Diſſ. Nerv. x.

By the Mediation of this Coat of the Lungs, that Preſſure of the Air ſhould be propagated to the Membrane lining the *Thorax*, which we commonly call the *Pleura*. But now at the End of Exſpiration, the *Thorax* being collapſed, conſider the natural Contractility of all the Membranes and Fibres of Animals, but eſpecially conſider the reticulated Work of muſcular Fibres ſurrounding the Lungs, and every Way pervading and ſtrengthening their Subſtance (*a*). Conſider theſe Circumſtances, I ſay, and you will ſtraight-way conceive how the contractile pulmonary Membranes and Fibres will, by their Re-action, in ſome meaſure ſupport the Action or Preſſure of the inflating Air; which therefore cannot preſs with its whole Force upon the *Pleura*; but the *phrenick* Nerves run along the *Pericardium*, covered very ſlightly by the *Pleura* or *Mediaſtinum*: So that in this ſuppoſed Moment of Time, at the End of Exſpiration, the Preſſure of the Air upon theſe Nerves, muſt be leſs than upon the other Parts of the Body, to which the compreſſing Force of the ſurrounding Atmoſphere has a freer and leſs interrupted Acceſs. Whence the Liquor of the Nerves, or

(*a*) Malpighi in Phil. Tranſ. 71. Abr. 11. p. 818. & Vitpoſth. p. 9.

or whatever Influence is communicated by them, must find a more free and easy Passage to the Midriff; whereby that Muscle begins immediately to contract itself; and by the Enlargement of the *Thorax*, Inspiration commenceth. During the Course of which, these Nerves continue rather freer from Compression, by the Inflation of the Lungs stretching more and more the contractile pulmonary Fibres, which therefore do more and more support the Pressure of the Atmosphere.

8. So then, after Exspiration, we find Inspiration must necessarily succeed; which will continue until the *Thorax* shall have acquired its ordinary Enlargement, by the natural and ordinary Depression of the Diaphragm. Then indeed the inspired Air, being rarified by the Heat of the Breast, and not finding a free enough Exit by the narrow Slit of the *Glottis*, will press every Way the containing Vesicles and Membranes of the Lungs. Which Pressure therefore will be forcibly propagated to the containing *Pleura*, and to the *phrenick Nerves*. Hence then their Influence must cease, and the Diaphragm be relaxed; and so from a mechanical Necessity, Exspiration must succeed by the spontaneous Restitution of the overstretched *Peritonæum*, and

abdominal Muſcles: For theſe compreſſing their contained *Viſcera*, muſt puſh the Midriff into the *Thorax*, and ſo compreſs and ſqueeze the Lungs much more forcibly than if they were left alone, to their own natural Contractility. Thus then the Preſſure of the Lungs upon the circumambient *Pleura* and phrenick Nerves, muſt ſubſiſt all the Time of Exſpiration, until at its End every thing come to that State of *æquilibrium* we firſt propoſed; whereon the Contractility of the Lungs bearing off ſome ſmall Part of the Preſſure of the Atmoſphere from the *Pleura*, the Spirits find a free Paſſage through the phrenick Nerves, the Diaphragm is contracted, and the Air inſpired; which very ſoon comes to be expelled in the manner juſt now expreſſed. May it not then be allowed that we have explained the mechanical Neceſſity of the alternate Dilatation and Compreſſion of the Lungs, as far as they depend on the Motion of the Midriff? Since that Muſcle being alternately contracted and relaxed, Inſpiration and Exſpiration muſt always ſucceſſively follow one another.

9. But ſince, beſide the Action of the Midriff, the Figure and Capacity of the *Thorax* ſuffers a conſiderable Change in Reſpiration, by the Contraction chiefly of the

the intercoſtal Muſcles, and that eſpecially in Women; the next Step ſhould be to conſider the Condition of the Nerves belonging to theſe Muſcles; whereby, from an alternate Compreſſion, or ſome ſuch Mechaniſm, the Muſcles may ſuffer an alternate Contraction and Relaxation.

In the common Account of both internal and external Intercoſtals conſpiring to dilate the *Thorax* and to produce Inſpiration, it were very eaſy to ſay that the Difference of the Preſſure of the Lungs upon the back Part of the *Pleura*, and conſequently upon the ſpinal Nerves running behind it that furniſh Spirits to the intercoſtal Muſcles, is ſufficient to our Purpoſe, in the manner we have explained the Action of the Phrenicks. But, beſides the Doubts I have a long Time entertained about the Action and Uſe of the internal Intercoſtals, I am afraid you will tell me, that the thoracick ſpinal Nerves, even before they be received between the double Row of intercoſtal Muſcles, are ſo well defended by the tenſe and firm *Pleura* covering them at the Side of the Spine, that the Variety of the Preſſure of the Lungs muſt have much leſs Influence on them, than upon the Phrenicks; for they, in their Courſe along the *Pericardium*, are but ve-

ry ſlenderly guarded; and muſt therefore too be much more liable to ſuch Differences of Compreſſion, than the other Nerves paſſing through the *Thorax* and influencing the Heart and other *Viſcera* equally in both States of Reſpiration.

And this puts me in mind of ſomething, which tho' not directly belonging to our preſent Subject, is worth obſerving in few Words; and that is, That (*a*) the intercoſtal and eighth Pair of Nerves, not only paſs through the *Thorax*, but pierce the fleſhy part of the Midriff. Whence you will be ready to conclude (as was hinted by *Morgagni* (*b*),) That their Influence on the abdominal *Viſcera* ſhould not be conſtantly uniform, but frequently puſhed on, and interrupted by Turns. And indeed this is very much countenanced by the wave-like periſtaltick Motions of the Stomach and Guts, which would ſeem to argue the Action of their Nerves to be promoted and obſtructed alternately

But tho' the alternate Action of the intercoſtal Muſcles may not be ſo ſatisfactorily explained in the manner above-mentioned, I do not deſpair of our coming to a better Underſtanding of it, if we were perfectly

(*a*) Vieuſ. Neurog. iii. 4. p. 183, 186. iii. 5. p. 194. 198.
(*b*) Adverſ. Anat. V. 12. p. 17.

fectly acquainted with every minute Circumſtance relating to the Structure of theſe Muſcles, and of the Blood Veſſels and Nerves belonging to them; which therefore I would earneſtly recommend to thoſe curious and ſubtile Diſſectors, who have both Skill and Opportunity to penetrate into the inmoſt Receſſes of the humane Body, that ſome Time or other we may become fully Maſters of ſo elegant a Problem.

COROLARY.

Of the Beginning of Reſpiration in born Animals.

The illuſtrious *Harvey* propoſed this Problem (*a*) "*Cur fœtus in utero, non reſpirans aerem, uſque ad menſem decimum, ob defectum reſpirationis non ſuffocatur? cum natus in ſeptimo vel octavo, quampriſmum aerem inſpirat, inhibitâ poſtmodum reſpiratione ob defectum aeris ſuffocatur,* &c." Many Solutions have been offered by phyſiological Writers, drawn from their different Hypotheſes of Reſpiration, the Juſtneſs whereof it is not our Buſineſs at all

(*a*) Exerc. II. ad Riolan. p. 101, &c. de Gen. Anim. p. 263.

all to examine: It is more to the Purpoſe to propoſe and endeavour at a Solution of another Problem ſomething a-kin to it; which either has not been well minded, or not well underſtood hitherto, *viz. Why a* Fœtus *in the Time of Geſtation never dilates its* Thorax, *nor at any Time before the Birth, performs, even ſlowly, the Motions of Inſpiration and Exſpiration ſucceſſively?* Since in the common Hypotheſis, the inſpiratory Muſcles having no Antagoniſts, or but weak ones, there is nothing to hinder the Dilatation of the *Thorax*, and the Reception of the Liquor of the *Amnios* into the Lungs; which therefore ſhould be alternately received and expelled, as the Air is in born Animals, if there were Forces ſufficient to carry on theſe Motions.

This Matter is eaſily cleared up from the preceeding Doctrine of alternate Reſpiration; let us ſuppoſe, according to the old Opinion (which ſome particular Conſiderations ſeem much to favour) that the two Orders of intercoſtal Muſcles antagonize one another; and we may eaſily allow, that in Geſtation, while the Fœtus continues envelopped in the *Secundines*, and immerſed in the *Colliquamentum Amnii*, the phrenick Nerves are too much compreſſed

to

to allow a free Passage of the Spirits to the Diaphragm. But as soon as the Animal comes to Light, and enjoys the external Air from any the least Motion of the Breast (and in every Birth many such Motions there are) the phrenick Nerves which were formerly compressed by the Lungs, *&c.* come now to have a Part of that Pressure taken off, in the manner we have formerly explained: So that they, being now at more Freedom, will contract the Midriff; which being once set a going, will for ever suffer an alternate Contraction and Relaxation, while the Animal continues in Life and Health.

XIII. *An ESSAY on the Nutrition of the* Fœtus *in* Utero, *by Mr.* JOSEPH GIBSON *Surgeon at* Leith, *Member of the Society of Chirurgeon-Apothecaries of* Edinburgh, *and City Professor of Midwifery.*

AS the most plausible Account of Generation, or the Principles upon which it is established, are equally obscure and controverted, so the Way whereby the *Fœtus*

Fœtus is maintained, both has and still continues to be Matter of Dispute amongst the Learned. Thus the Memoirs of Medicine make it abundantly evident, that the Question relative to the Nutrition of the *Fœtus in utero* was very early agitated, as well by Philosophers as Physicians; and as they did not agree in their Sentiments, so the Controversy, even till this Day, stands undecided amongst the Moderns; and tho' I am well enough aware, that many more Difficulties lie in the Way than I am able to remove, yet in order to clear this intricate Subject as much as I can, from these Obscurities with which it is so much clouded, I shall adventure;

First, *To range and state the different Opinions of Authors, together with the Grounds and Arguments that support them; and by the Way shall hint also at those which do oppose them.*

2dly, *I shall explain that Opinion which appears to me to be most consistent with Truth, and endeavour to confirm it by evident Facts, rational Consequences, and natural Analogy.*

Agreeable then to this Method, the first Opinion relative to the Nutrition of the *Fœtus in utero*, that offers it self to our Consideration, is the following,

That

That the Fœtus *receives all its Nouriſhment by the Mouth.*

This Notion was very early vented by *Democritus* * and *Epicurus*, as *Plutarch* teſtifies in his Book *De placitis Philoſophorum, lib. 5. cap.* 16. For maintaining whereof,

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* Tho' *Plutarch* names *Democritus*, without any appellative or diſtinguiſhing Epithet, yet it is not once to be doubted that it is *Democritus Abderitanus*, to whom he aſcribes this Tenet, and not to *Democritus of Co*; nevertheleſs I cannot avoid to obſerve (tho' foreign to my preſent Purpoſe) that more than Juſtice is done to the firſt by the Generality of Authors (*a*) when they aſſign to him the Honour of having been Maſter to the divine *Hippocrates*; for if we reflect upon the Variety of Arguments uſed by the People of *Abdera* to perſuade *Hippocrates* to come to, and undertake the Cure of *Democritus* their Fellow-Citizen; that of his having once been his Maſter, could never have eſcaped them; nor would *Hippocrates* have engaged in that Voyage, and in the Care of *Democritus*, rather "*from a commendable enough* "*Reverence to the Gods and Nature*, as he expreſſes it (*b*), than at the moſt moving Entreaties of the People of *Abdera*, or from a grateful Senſe of *Democritus* having been once his Maſter; which Conſideration alone would have been a ſufficient Motive to have made him comply with their Deſire, if we remember the Obligations he laid upon his Diſciples by Oath (*c*), "to ho-"nour the Perſon who taught them the Art of Medicine, as their "natural Parent, to let him participate of all that lay in their "Power in relation to the Neceſſaries of Life, *&c.* Wherefore, when *Hippocrates* is ſaid to have been the Diſciple of *Democritus*, in my Judgement it ought to be underſtood of *Democritus of Co*, as Doctor *Douglas* (*d*) hints, tho' I think the Authority quoted for proving this, is by no Means to be found in that Place of *Celſus*, which is pointed at by this learned Gentleman.

(*a*) Soranus, Suidas, Celſus, *&c.* (*b*) Epiſt. S. P. Q. Abderitarum. (*c*) Hippoc. Jusjurandum. (*d*) Bibliograph. Anatomic. Specim. p. 7.

whereof, the same Author tells us, That these old Philosophers assigned the following Reasons, That in the *Uterus* there are little Duggs, to which the Embryo applies its Mouth, and from thence sucks its Aliment, and that therefore so soon as it is born, it draws its Nourishment in the same manner from the Breast.

The first of which being imaginary, does not merit our Attention; nor is there more in the second, as will appear from what may afterward be advanced. *Hippocrates* indeed, and after him many of the Moderns, have added much stronger Reasons to prove that the *Fœtus* receives Nourishment at the Mouth; but seeing the divine old Man has likewise maintained that it is also supplyed by the *Umbilicus*, what he has delivered in support of the first Opinion, will come more naturally under our Thoughts, when we treat of the Fourth; and therefore I shall in this Place take Notice only of those new Arguments which I find advanced by any of the Moderns to strengthen this old Doctrine, and which will not so readily occur afterwards: These are reducible either to a Denial of any Communication of the Blood Vessels of the Mother and Infant, or to an absolute Unfitness of the Mother's Blood for that Purpose.

Clau-

Claudius de la Courvee, *Charleton*, *Antonius Everhardus*, *Franciſcus Bayle*, *Vander Wiel* the Father and Son, have ſtrenuouſly maintained the firſt of theſe by many Arguments, which being moſtly hypothetical, can by no means be particularly anſwered in this confined Place; therefore let it ſuffice to ſay in general, That the Denial of any Communication betwixt the Blood Veſſels of the Mother and Infant, (which ſolely depends on this, That there follows no Blood upon the Diviſion or Separation of the umbilick Veſſels from the *Cotyledons* of Brutes) is an Inference too haſtily and inconſequentially drawn, from a true Obſervation; for not to mention a multitude of Things, beſides the Number in which the Brute *Cotyledons* do differ from the humane *Placenta*, the very Phænomenon which happens upon the Separation of the Extremities of the Blood Veſſels that belong to the Brute *Fœtus*, from the *Alveoli* or Sockets in which they are lodged, as it is very remarkable, ſo it eaſily ſolves the Difficulty; for theſe *Alveoli*, upon the Extraction of the umbilick Veſſels from them, are by their proper Elaſticity inſtantly curled up, or as a Purſe-mouth drawn together; whereby the Effuſion of the leaſt Drop of Blood from them muſt

must necessarily be prevented: Whereas the uterine Arteries of the humane Females, having the umbilick Veins of their proper *Fœtus* immediately implanted into them, without any interveening *Medium* (as in the comparative Instance just mentioned) do constantly pour out Blood, upon the Separation of the *Placenta* from the *Uteri* in Abortions and at Deliveries, which is always in a greater or lesser Quantity, and sooner or later loses the Colour and Consistency of Blood, as the uterine Vessels are more or less elastick, or as there are wanting or present Impediments to the Contraction of the Womb.

Mr. *Jussieu* (so far as I remember) stands alone, in maintaining the Nutrition of the *Fœtus* by the Mouth, from the Consideration of the absolute Unfitness of the maternal Blood for its Support, imagining and asserting that there exist in it many fiery and but few alimentary Particles; and that its Motion being too rapid, would rather beat into Disorder the weak and tender Parts of the Embryo, than gradually extend and encrease it. The first two of these Arguments being trifling and precarious, scarcely deserve to be recited, far less to have any particular Answer: Nor does there appear to be much in the Third; how-

however I ſhall have Occaſion in the Sequel of this Eſſay, to obviate its Force.

The *Second* Way then which we find condeſcended upon by the Writers of Phyſiology or Anatomy, whereby they ſuppoſed the *Fœtus in utero* to have been nouriſhed, was by the umbilick Veſſels, and by theſe only.

The *Stoick Philoſophers* (*a*) were the firſt who taught and maintained this Doctrine, and ſo far as I can obſerve enjoyed it alone for a very conſiderable Time, tho' it is indeed obvious that *Hippocrates*, *Ariſtotle* and *Galen* did alſo early affirm that the *Fœtus* received Part of its Nouriſhment this Way, yet ſince it is likewiſe evident that they did not reſtrict its Conveyance to the umbilick Veſſels only, they are by no means to be eſteemed Abettors of this *Dogma*; and therefore *Andreas Laurentius* (*b*), to whom ſoon afterwards *Fabricius ab Aquapendente* (*c*), aſſented, is the firſt amongſt the medical Tribe who may be reckoned to have adopted this Opinion: But indeed many amongſt the Moderns have ſince liſted themſelves as Champions ready to defend this Cauſe, I might here

(*a*) Plutarch de Placit. Philoſ. lib. v. cap. 16. (*b*) Lib. viii. cap. 6. (*c*) Lib. de format. Fœt. cap. 8.

ſelect my learned and ingenious Friend (*a*), for whom I have the greateſt Regard, and who ſo juſtly bears a conſiderable Character in that Society of which I have likewiſe the Honour to be a Member; but ſeeing he has hitherto only given it Countenance by affording ſome Remarks and Obſervations tending to eſtabliſh it, which he communicates to us by the Works of another (*b*), I chuſe rather to conſider the Arguments advanced for its Support by Dr. *Bellinger* (*c*), who has treated this Subject *ex profeſſo*.

This learned Gentleman taking the Communication between the Mother and Infant by means of the umbilick Veſſels as granted or ſelf evident, goes on to eſtabliſh the above Doctrine by negative Arguments, wherewith he pretends as well to exclude the Mouth from having any Part or Share of Action in the Nutrition of the *Fœtus*, as to demonſtrate that the *Liquor Amnii* is an unfit *Pabulum Nutritionis*, and thence infers, that the *Fœtus* muſt receive all its Nouriſhment by the umbilick Veſſels; but how well he ſucceeds in this I ſhall preſently enquire, by conſidering his Argu-

(*a*) Mr. Monro Profeſſor of Anatomy. (*b*) Mr. Cheſelden's Syſtem of Anatomy. (*c*) De fœt. nutrit.

Arguments as they ly in Order, of which this is the firſt and principal one,

" That ſince Monſters have been brought " forth perfectly formed, their want of " Mouths or, in ſome, of Heads excepted, " the *Fœtus* cannot therefore in a natural " Way be imagined to have its Nouriſhment " communicated to it by the Mouth."

It might perhaps be eſteemed a ſufficient Reply to this Argument, to retort upon him his own Anſwer to Mr. *Bayle* upon another Occaſion : " That we are not alto- " gether to rely upon ſome Experiments " and accidental Occurrences in account- " ing for all the Proceedings in the animal " Machine. But to be more particular, this Argument depends upon a very uncertain and precarious Suppoſition, namely, that the want of any Part in an otherwiſe well grown monſtrous *Fœtus* proves it to be uſeleſs in a natural State, for at this rate (among many other Inſtances) it might be as juſtly denied, that the *Par Vagum* in a natural *Fœtus* does contribute to the Motion of the Heart, becauſe one of the Monſters he condeſcends upon, *viz.* that taken from *Parè* wanted the Head ; but as in ſuch Inſtances where a Part of the Body is naturally ſupplied by two Veſſels, and has by any Accident one of them obſtructed,

we do nevertheleſs frequently ſee the Part to be well enough provided for by the other; ſo in the Caſe before us, the Heart, which has naturally Nerves both from the *Par Vagum* and *Intercoſtal*, is ſufficiently ſupplied by the latter, tho' the great *Lower* (*a*) has undeniably proved that it is the former, which is the principal Inſtrument of the Motion of the Heart in Man and thoſe Animals whoſe Bodies ſtand erect; wherefore it would in my Judgment be very raſh to conclude, tho' *Parè*'s Monſter wanted the Head, that therefore the *Par Vagum* in a natural State is of no Uſe; for my own Part, in ſuch ſingular Inſtances I think it more reaſonable to be ſatisfied with attributing a greater than ordinary Share of Action to that Part which ſupplies the want of the other, than to deny the natural and ordinary Function of that other Part, in Oppoſition to the moſt evident Signs of its Operation, this being to determine what is natural by what happens once, rather than by what happens uſually or almoſt always.

Next I would obſerve, that where Monſters have been brought forth wanting Heads, or at leaſt having their Mouths ſhut, it is obſervable that this Defect, when ſuch

(*a*) De Mot. Cord.

ſuch Productions have been accurately examined, is often, if not always, found to be ſupplied by ſome other Contrivance.

To prove this Poſition I ſhall condeſcend upon two Examples, the one taken from a humane and the other from a brute *Fœtus*; the firſt of theſe being recited by Dr. *Gibſon* in his *Anatomy of Humane Bodies* (*a*) at ſome Length, I muſt refer to the Paſſage, and only tranſcribe his *Scholium* upon the Diſſection: "This (*ſays he*) is a plain Con-
" firmation of the *Fœtus* being nouriſhed
" by the Mouth; for the *Gula* being im-
" pervious (which is equal to its wanting
" the Head, or having its Mouth ſhut) Na-
" ture had formed a Hole in the Wind-
" pipe and below in the Gullet, for the
" Liquor contained in the *Amnios* to paſs
" into the Stomach, which it might eaſily
" do without Prejudice, or any Fear of
" choaking the Child in the Womb while
" it breathed not; but when it was born
" and came to breath, there could be no
" longer any Paſſage this Way, and ſo the
" Infant was neceſſarily famiſhed." And agreeable to this, *Vander Wiel* (*b*) the Father aſſures us, that at the *Hague* he himſelf ſaw a monſtrous Lamb, who having no

(*a*) Lib. 1. cap. 33. (*b*) Vol. 2. Obſervat. 32.

Mouth, had its Nouriſhment during its Stay in the Womb of the Dame conveyed to it by an Aperture in the lower Part of the Neck.

But further, when this Deviation from Nature does happen, and is not ſupplied in the Manner I have hinted, the Stomach is found empty, and there are few or no Excrements in the Guts (*a*).

In fine, as the Examples of ſuch Monſters are rare, neither extraordinary well vouched, nor often accurately examined, the Arguments drawn thence againſt the Nutrition of the *Fœtus* by the Mouth can never be concluſive, and in my Opinion are ſufficiently obviated by what I have already advanced, therefore I ſhall go on to conſider the Doctor's ſecond Argument, which ſtands thus:

"That the Lips of all Animals, even "when naturally formed, are ſo cloſely "ſhut before their Birth, that it is as diffi- "cult to open them as their Eyes or No- "ſtrils, wherefore the *Fœtus* can receive "no Part of its Nouriſhment by the "Mouth."

But this is a Fact which I refuſe *ab autopſia*, and do appeal to thoſe who are converſant

(*a*) Regner. Graaff. de mulier. organ. gener. inſerv. cap. 15.

verſant in Embryotomy, whether they do not for moſt Part find all, as well humane as brute *Fœtuſes* when yet incloſed in the Membranes and ſwiming in the *Liquor amnii*, to have their Mouths more or leſs open, and even frequently obſerve that their Tongues do ſomewhat hang out; but ſince I ſhall have Occaſion afterward to prove this at greater Length, I ſhall proceed to the learned Gentleman's third Argument, which is,

That tho' the Mouth of the *Fœtus in utero* were open, and allowed to be capable of receiving Nouriſhment by it, yet the *Liquor amnii* in which it ſwims is not a proper *Pabulum* for its Support; and this he takes to be ſufficiently eſtabliſhed by the following Hiſtory: " A certain Woman " for ſome conſiderable Part of her Pre- " gnancy having laboured under a virulent " *Gonorhœa*, but by proper Applications " was cured (tho' not long before her Time " was up) the Phyſician who attended be- " ing curious to know the Circumſtances " of her Delivery, was informed by the " Midwife and ſeveral other Women then " preſent, that when the Waters broke " there was a Stench ſo offenſive that ſome " could ſcarce endure the Room, and the " Midwife aſſured him upon the Queſtion,

" that it was from the Waters that ill Smell
" arose; notwithstanding this, the Child,
" which is a Girl and still living, was born
" well and healthy, but the Membranes
" of the Secundine were very tender and
" almost rotten: How can it then be ima-
" gined, adds he, that this Child could
" live upon such Waters for its Food? or
" how was it possible, if it had received
" any of them into its Stomach, that they
" should not contaminate the tender *Visce-*
" *ra* so as to have destroyed the *Fœtus*."

I am so far from being of Opinion that this History proves what Doctor *Bellinger* intends, that I even venture to affirm it rather supports the very contrary Doctrine, for sure I am the *Fœtus* was in much greater Hazard of being contaminated, by having such Nourishment sent immediately into the Blood by the umbilick Vessels, than if it had received it by the Mouth and Stomach, for hereby its vitiated Qualities might possibly have been altered; hence Doctor *Pitcairn* (*a*) affirms, that many acid Substances when taken into the Stomach do soon turn alcalious; and Naturalists do unanimously agree, that there are many Poisons, such as the *Virus* of Asps, Vipers, &c.

(*a*) Differt. de operâ quam præstant corpora acida vel alcal. in curat. morbor.

&c. which are abſolutely innocent when taken by the Mouth, but carry along with them preſent Death when immediately mixed with the Blood: Thus we find the brave *Cato*, when marching the Remains of *Pompey*'s Army through *Africa*, wiſely animating the thirſty Soldiers to drink of a Spring that came in their Way, which they were afraid to touch becauſe they found many Serpents in it, by telling them,

Noxia ſerpentum eſt admiſto ſanguine peſtis,
Morſu virus habent, & fatum dente minantur,
Pocula morte carent (*a*).

And *Celſus* (*b*), when ſpeaking of the Serpent's Poiſon, ſays, *Non guſtu, ſed in vulnere nocet.*

But I muſt own that Alcalines or even Alcaleſcents are not turned into an oppoſite Nature in the Stomach, and that many vegetable as well as mineral Poiſons are deadly tho' taken by the Mouth; yet certain it is, that any noxious Matter when immediately mixed with the Blood does as certainly but more ſuddenly produce its direful Effects, (as many Experiments evince)

(*a*) Lucan. Pharſal. lib. ix. (*b*) Lib. v. cap. 27.

vince) than when the ſame individual Thing is ſent into the Body by the ordinary Paſſages. Hence *Galen* (*a*) tells us, "That "nothing has the ſame Power upon the "humane Body outwardly as inwardly; "(for ſays he) neither the Venom of the "Viper, nor of the Aſp, nor frothy Spittle "of the mad Dog, are alike miſchievous "when they fall upon the Skin or enter "into the Stomach, as when communica-"ted to the Blood by a Wound." But here indeed the Tables are turned, for what is ſafe and innocent when mixed with the Blood, is rank and deadly Poiſon if taken by the Mouth, or elſe what is fully as remarkable, the *Placenta* has the Faculty of ſeparating the pure from the impure, and has the Goodneſs to ſend the impure to the *Amnios* where it does no Harm, and the pure to the *Fœtus* where it does much good.

The laſt Argument which our learned Author brings upon the Field, to prove the Nutrition of the *Fœtus* to be by the *Umbilicus*, is deduced from the Analogy between the Nature and Uſe of the *Albumen Ovi* and the *Liquor Amnii*; but as what he advances upon this Head ſtands in Oppoſition

(*a*) De Tempera. lib. iii. cap. 2.

poſition to the moſt valuable, as well as ſelf-evident Diſcoveries of the learned *Malpighius* and *Bellini*, I ſhall make no other Return to it, than to inſtitute a ſhort Parallelogram between the Aſſertions of Dr. *Bellinger* and the two juſt now mentioned Luminaries.

Bellinger (*a*) maintains, that the *Cicatricula* is always inſeparably united to the Yolk, but never adheres to the White, nor has any Paſſages to it that are viſible with a Microſcope; and thence concludes that the Chick receives all its Nouriſhment from the Yolk, but never any from the White; and therefore infers, that the *Liquor Amnii* in viviparous (which is analogous to the *Albumen Ovi* in oviparous) Creatures can be of no Uſe in the Nutrition of their *Fœtuſes*.

But *Bellini* (*b*) aſſerts, that a few Hours after Incubation the *Cicatricula* naturally leaves the Yolk, and aſcends to the *Folliculus Aeris*, where it remains till the Excluſion of the Chick. *Malpighius* (*c*) and *Bellini* demonſtrate, that the Yolk communicates but little to the Chick, till within a few Hours before it is hatched, when it is drawn in wholly by the *Ductus inteſtinalis*

(*a*) Pag. 49. (*b*) De Mot. Cord. Prop. ix. (*c*) De format. Pul. & de ovo incub.

sinalis Stenonis, or rather indeed and more properly of *Needham* (*a*), and by it is conveyed to the *Intestinum Ilium*, to be voided soon after its Exclusion: And therefore both affirm, that the Chick is nourished mostly by the White which is colliquated and forced into its Bill by the *Folliculus Aeris*.

Having thus briefly discussed Doctor *Bellinger*'s Objections against the Nutrition of the *Fœtus* by the Mouth, I go on in the next Place to take notice of another and third Way whereby *Alcmæon* of *Crotona* (*b*) supposed the *Fœtus* to be nourished; and that was, by drawing to itself, as a Spunge, Nourishment on all Sides of its Body; and truly numberless Experiments do put it beyond Doubt, that the Parts and Membranes of Animals are possessed of an absorbing or bibulous Quality; wherefore it will be no Absurdity to affirm, that the *Fœtus* (by taking up some Portion of the *Liquor Amnii* in which it swims) is in Part nourished by the Surface of the Body, as our Author taught, particularly during the first three Months; but after this Period I am of Opinion that these Inlets are in a great measure, if not altogether obstruct-

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(*a*) De for. Fœt. cap. iv. (*b*) Plutarch. loco antea citato.

ed and covered over with a whitiſh Matter, at firſt tough, (and without Diſpute the moſt viſcid Part of the *Liquor Amnii*) but afterwards, in a great many Inſtances, dried by the Heat of the Body into a kind of Cruſt well enough known to the Midwives, ſince every Day it gives them ſo much Trouble to remove.

But I haſten to the fourth and laſt Opinion, which to me is abundantly probable, and teaches that the *Fœtus* is nouriſhed as well by the Mouth as by the umbilick Veſſels.

This Notion of the Nutrition of the *Fœtus* is as old as the great Maſter and Founder of Medicine the divine *Hippocrates*, who in his Book *de Alimento* (*a*) and elſewhere teaches, that Nouriſhment is carried by the *Umbilicus*, as in his Treatiſe *de Carnibus* (*b*) he maintains, that the Child in the Womb with its Lips compreſt together attracts Nouriſhment, *&c.* which laſt he enforces with two very maſterly Arguments, namely, that unleſs the *Fœtus* had ſucked *in utero*, it neither could depoſite Excrement, nor know how to ſuck ſo ſoon as it is born; both which I would further illuſtrate, were I not aware that this laſt menti-

(*a*) § 7. (*b*) § 8.

mentioned Book is commonly ſaid to be ſpurious, and therefore any Quotation taken from it can fix nothing upon *Hippocrates* that is not conſiſtent with what is taught in ſuch of his Books as are owned to be genuine; wherefore I ſhall not now ſtay even to offer any Arguments that might be brought to prove that there is not quite ſo much Reaſon to ſuſpect this Book as is ordinarily alledged, in regard *Hippocrates* himſelf ſeems to have conjoined theſe two Opinions for which I now contend, in his Treatiſe *de Natura Pueri*, which ſo far as I remember has never hitherto been called in Queſtion, at leaſt it is to be found in the earlieſt Catalogue of the genuine Books of this Author as given by *Erotian*: For there *Hippocrates* (*a*) maintains the firſt of theſe, by telling us that the *Embryo* is nouriſhed by menſtrual Blood ſent into it by the *Umbilicus*, and lower in the ſame Book (*b*) he points at the ſecond; for there, after having taught from what Part of the Aliment the Milk is drawn, and likewiſe having inculcated the Doctrine of the Inoſculation of the mammary with the hypogaſtrick Veſſels, by ſaying in expreſs Terms, "That Milk is carried to the Breaſts and "Womb

(*a*) § 5. (*b*) § 21.

" Womb by the ſame Veins; for theſe " Veins and others like them (ſays he) go " both to the Breaſts and to the Womb; " and then adds, *When this little Quan-* " *tity of Milk is come into the Womb the* " *Child uſes or enjoys it.*" Now if we reflect upon theſe Paſſages it will be very evident that *Hippocrates* believed that the *Fœtus* was nouriſhed by two different Species of Aliment: Hence in a ſubſequent Part of that ſame Treatiſe he expreſſes this very clearly, by telling us (*a*), " *That the* " Fœtus *draws to itſelf the ſweeteſt Part* " *of the Blood, and likewiſe enjoys a little* " *Milk:* " Which points as well at the menſtruál Blood carried to the *Fœtus* by the umbilick Vein, as at the *Liquor Amnii* drawn in by the Mouth; it is true this laſt is not ſaid in expreſs Terms, yet I think it is plainly underſtood: And thus we find *Galen* (*b*), who is by all allowed to have underſtood *Hippocrates* beſt, alluding to theſe Excerpts, when he tells us, " *Neither,* " *when* Hippocrates *ſays that the firſt Nou-* " *riſhment is brought by the Navel, are we* " *to think him ignorant of the* Fœtus *being* " *nouriſhed by the Mouth, for he has alſo* " *ſpoke of this Way.*" We can never then imagine

(*a*) § 40. (*b*) Lib. an animal ſit id quod in utero eſt, cap. 3.

imagine that he is here pointing at the Paſſage above cited from the Book *de Carnibus*; for there the Nutrition of the *Fœtus* by the Mouth is ſo expreſly ſaid, that *Galen*'s Caution would not only be ſuperfluous but impertinent: But that this may be further evident, *Galen* looked upon the Book *de Carnibus* as ſpurious, and therefore its Title is not to be found in any of the Accounts he gives of the Works of *Hippocrates*, at leaſt ſo far as conſiſts with my Knowledge; and this alſo is the Opinion of *Le Clerc* (*a*).

But not to dwell too long here, this Doctrine ſubſiſted from the Time of *Hippocrates* its Author till that of *Laurentius* (*b*) and *Fabricius ab Aquapendente* (*c*), who brought it into Diſcredit, under which it continued till it was again revived and well ſupported by the immortal *Harvey* (*d*), who likewiſe maintained that the *Fœtus* was nouriſhed both by the umbilick Veſſels and by the Mouth, with this Variation, that *Harvey* (*e*) ſubſtituted an albugineous Aliment in place of *Hippocrates*'s menſtrual Blood. Into which Difference as I am not now to enquire, ſo I ſhall proceed to eſtabliſh this Opinion in the beſt Manner

(*a*) Cap. 27. (*b*) Lib. viii. cap. 6. (*c*) De for. Fœt. cap. 8. (*d*) Exercitat. 57. (*e*) De acetabu. uteri.

Manner I can; but in order to do this more accurately, it may be proper to conſider (though ever ſo briefly) the *Embryo*'s gradual Growth.

The impregnated *Ovum* being ſhut up in the Cavity of the *Uterus* by the Contraction of its Fibres, fluctuates and ſwims in theſe Humidities which continually diſtill from the Extremities of the uterine mucous Veſſels, Part of which Fluid penetrating the Coats of the *Ovum*, and paſſing by the Pores of the Skin into the *Homuncio* (as *Alcmæon* taught) muſt enlarge both, ſo that their Bulk will fill the Capacity of the *Matrix*, and then the Beginnings of the Veins in the *Placenta* will be implanted into the Extremities of the uterine Arteries, through which Part of that *Serum* or Lymph which before fell into the Cavity of the *Uterus* will now be carried to the *Embryo* by the Beginnings of the umbilick Vein, and what is more than neceſſary is again returned by the umbilick Arteries to the Mother; thus for ſome Time there is a continued Circulation of Lymph, until the umbilick Veins are ſo much enlarged, that they are capable of receiving red Blood from the Extremities of the dilated uterine Arteries: But when this does fall out, whether about the End of the third Month,

when Abortions (as thoſe who are acquainted in Midwifery do know) moſt frequently happen, is ſomewhat difficult to determine.

However it perhaps may in this Place not be unpleaſant to obſerve the infinite Wiſdom of our great Creator, ſo evident in the ſingular and wiſe Contrivance by which this Circulation is begun and maintained; for at firſt the Motion of the Lymph and afterwards of the Blood from the Mother to the tender *Embryo* is exceeding languid and gentle, being but eaſily forced along the contorted Branches of the capillary Arteries of the *Uterus*, and propelled through the ſmall Beginnings and great Length of the umbilick Vein by no other Force than that of the ſubſequent Blood, by which admirable Mechaniſm the beating into Diſorder the Parts of the weak and tender *Embryo* by the rapid Motion of the Blood drove upon it by the reiterated Pulſations of the Arteries, (a Hazard of which ſome have dreamed) is happily prevented.

Thus then in the firſt Months is the *Embryo* ſuppoſed to be nouriſhed; but ſince the Veſſels of the *Uterus*, which do not communicate with thoſe of the *Placenta*, will only ſeparate a viſcid and tranſparent Liquor,

quor, which, by paſſing through the Pores of the *Chorion* and more delicate *Amnios*, is thereby filtrated and made more fit for the Food of the *Embryo*, and forms that Liquor in which the *Fœtus* ſwims and which it takes in by the Mouth, as ſeems evident from theſe following Reaſons:

Firſt, the Fluid contained in the *Amnios*, and in which the *Fœtus* ſwims, is not an excrementitious Liquor, but a *Materia nutricatûs*; hence it is to be found in a very conſiderable Quantity (*a*), even before the Parts of the *Fœtus* are viſibly delineated, and therefore ſure it can never be deemed an Excrement; or were it ſuch, Nature would not give her ſelf the Trouble to form ſo fine and delicate a Membrance as is the *Allantois*, if it ſerved to no other Purpoſe, than to prevent the Urine of the *Fœtus* from mixing with another excrementitious Liquor. Nor can the *Allantois* be deſigned to keep the Urine of the *Fœtus* from galling and excoriating its Skin, when this would equally happen from the Liquor in which it ſwims, if it were, as is alledged, the *materia perſpirationis*: But how evidently does the Being of the *Allantois* demonſtrate the Wiſdom of a ſuperintending

(*a*) Harv. Exerc. LVI. & lib. de Membr. & Humor.

tending Providence, by effectually hindering the Urine of the *Fœtus* from mixing with the *Liquor Amnii*, its Food? But further, if it be true, (as undoubtedly it is) that there is no Communication or immediate (*a*) Connexion between the *Uterus* and impregnated *Ovum*, for at least the first two Months, then certainly it must be acknowledged to be the *materia nutricatûs*; for it does not alter the Nature of the Argument, that in this Period it passes into the *Fœtus*, rather *per habitum corporis*, (as was before hinted) than by the Mouth, and thus in Mares and Swine there is no Communication between the *Uterus* and the *Chorion*, till they be at least half gone (*b*), which undeniably and demonstratively proves the *liquor Amnii* to be a proper Nourishment for the *Fœtus*, unless some sensible Difference can be condescended upon between the Liquor in these, and that of other Creatures; But further, if this Liquor was not nutritious, and actually consumed by the *Fœtus*, more of it would be found in the *Amnios*, at or near the Birth, whereas it is then ordinarily observed to be almost spent.

Secondly, The Mouth, nay even its Chasm

(*a*) Harv. Exerc. LVI. (*b*) Fab. ab Aquap. de Form. Fœt. Part. I. cap. 3.

Chaſm, long before the Lips are obſervable, is always open, as any who will take the Trouble to blow a little Air upon it by a Pipe, may ſoon be convinced of; for then they will remark its Sides evidently divide, which yet by no Means happens to the Eyelids, nor Ears, tho' the ſame Method is uſed; and that it continues to be ſo afterwards, is evident from an Obſervation communicated by an Author of Regard (*a*), who aſſures us, that oftner than once, in the cold Winter Seaſon, he found the *liquor amnii* frozen, and continued thro' the Mouth and *Oeſophagus* to the Stomach, in a pretty large Column, which not only demonſtrates the *liquor amnii* to be a proper *materia nutritionis*, but even puts the Matter beyond all Diſpute, that it is by the Mouth this Liquor is conveyed to the *Fœtus*.

Thirdly, There are Examples of humane Fœtuſes which have been brought into the World alive, either altogether wanting the *Umbilicus* and its Veſſels, or at leaſt having the umbilick Rope broke aſſunder ſome conſiderable Time before their Birth, as *Chatton*, and *Vander Wiel* the Father do relate (*b*). Thus it is evident that the

(*a*) Heiſter. Comp. Anat. in Not. pag. 247. (*b*) Vander Wiel, Vol. 2. Obſerv. xxxii.

Fœtus may be nourished by the Mouth alone, when the umbilick Rope is wanting, as well as by the umbilick Vessels, when Monsters are brought forth wanting Heads, which I think is all should be made of these particular Instances and Deviations of Nature, from her ordinary Manner of operating; and thus it is as well with this View, I have related these Histories in support of my present Argument, as to convince Dr. *Bellinger* of a Mistake he seems to ly under, when he tells us (*a*), "That Nature has "brought the *Fœtus* of some Animals to a "Degree of Perfection in all other Parts, "without the Assistance of Head or "Mouth; but never without the umbilick "Vessels; which he even challenges the "whole History of Physick to contradict.

But that the Force of these Arguments may appear in one View, let me add by Way of *Scholium* upon them, that seeing all the Fœtuses of viviparous Creatures swim in the *liquor amnii* (an undeniable *pabulum nutritionis*) and for the most part of Gestation have their Mouths open, we may safely *à priori* conclude that Part of this Liquor enters that Passage; and since we actually find the very same individual Li-

(*a*) Tract. de Nutrit. Fœt. cap. 9.

Liquor in the Mouth, *Oeſophagus* and Stomach, as is evident from *Heiſter*'s Obſervation, and that there is ſometimes no Connection between the Mother and Infant, by Means of the umbilick Rope, whereby it can be ſuſtained, as in the Examples from *Chatton* and *Vander Wiel*, we may likewiſe affirm *à poſteriori*, that the *Fœtus* has part of its Nouriſhment from the *liquor amnii*, and that it is conveyed to it by the Mouth.

But if we go further, and obſerve the Nature of that Liquor contained in the *Amnios*, and that found in the Stomach of the *Fœtus*, we will ſoon perceive that they agree in Colour, Smell, Taſte, and every other ſenſible Property, excepting that the ſtomachical Liquor is a little more gelatinous, ſome of its thinner Parts being ſuckt up by the abſorbent Veſſels of the Stomach, which more and more obtains in its gradual Deſcent thro' the Inteſtines, its nutritious Particles being in the ſame Manner taken in by the Lacteals, till at laſt in the Great Guts it is very much thickned; and then it changes alſo its Colour by the Mixture of the Bile and *ſuccus pancreaticus* with it; whence it has the Name of *Meconium* beſtow'd upon it. But in the laſt Months, theſe Liquors differ yet more obſervably;

for that in the *Amnios* is vaſtly thinner, being more conquaſſated as well by the Motions of the Mother, as by the Stirrings of the *Fœtus*; nay it even at this Time acquires a ſaline or urinous Taſte, which is yet no Argument againſt its nutritive Quality; for Nature gives a *folliculus aeris* to an Egg, to attenuate the viſcid White into the moſt ſubtile *Fluor* (*a*) which is not coagulable (*b*), but evaporates like Urine, thereby changing its inſipid and inodorous Subſtance into a ſaltiſh ſtenching Nature, that it may be rendered fit for the Nouriſhment of the Chick.

In fine, if we remember, that in ſuch Inſtances where Monſters have been brought forth, wanting Heads, Mouths, or *Suppar* to either, the Stomachs of ſuch are found empty, we may reaſonably conclude that the *liquor amnii* is the ſame with the Liquor found in the Stomach of natural Fœtuſes, and may be convinced that this Liquor is conveyed thither by the Mouth.

I have already anſwered, (as much as this confin'd Place would permit) the Objections to this particular Opinion, when I treated of the firſt and ſecond Way whereby the

(*a*) Bellin. de Mot. Cord. Prop. viii. (*b*) Ibid. Propoſit. 6.

the Fœtus is ſuppoſed to be nouriſhed, and therefore might here put an End to the Whole; and tho' I have all along choſen rather to reaſon from Facts, than to introduce Arguments depending upon uncertain Hypotheſes; yet ſince Nature is always obſerved to act after a very uniform Manner, I ſhall in order to illuſtrate further what I have been hitherto maintaining, ſubjoin two analogical Arguments, and with theſe conclude this Diſſertation. The firſt whereof is taken from the Analogy between the Vegetation of Infant Plants and Nutrition of Animal Fœtuſes; for 'tis well known, that Plants *in ſemine* have two different Roots; firſt the ſeminal, whoſe Fibres are inſerted into the *Cotyledones* of the Seed, to convey to the Plant its firſt Nouriſhment from the Mother Earth, and by which it is gradually extended, till it ſhoots out its ſecond or plantal Root, whereby it more immediately receives Sap or Nouriſhment from the Ground; and thus for ſome Time being ſupplied by both, the plantal Root becomes at laſt large enough to nouriſh it alone; and then there being no more Occaſion for the *Cotyledones*, they die and fall off. Juſt ſo the Fœtuſes of Animals have two Roots, (if I may be indulged in the *Simile*) the umbilick Veſſels, which

which by the Intervention of the *Cotyledones* or *Placenta* derive a Liquor from the Mother for its Nouriſhment, by which it is gradually encreaſed, till the Mouth and *Viſcera* (its ſecond Root) be formed and inlarged to receive Part of its Aliment alſo, then it continues to be ſuſtained both Ways, till it become ready for the Birth, when its ſeminal Root, the *Cotyledones*, fall off, or the *Placenta* is ſeparated, and the Infant born, when, as all know, it is able to be wholly ſupplied by its Mouth or plantal Root.

But the laſt analogical Argument I mention is taken from the *apparatus* for nouriſhing the Chick *in ovo*, where we muſt obſerve, that there is a ſimilar Liquor, as well as Veſſels deſigned for the ſame Uſes, as in Animals. Thus the *albumen ovi* is colliquated gradually by the *folliculus aeris*, and Heat of Incubation, and ſent into the *Cicatricula* or *Amnios*, for the Nouriſhment of the Chick; as in Animals the *liquor amnii* is elaborated and fitted for the Aliment of the *Fœtus*, by paſſing thro' the Pores of the *Chorion* and *Amnion*, the *albumen ovi* is always found in the Mouth and Gizzard of the Chick, as the *liquor amnii* is obſerved in the Mouth and Stomach of the *Fœtus*. The *albumen ovi* is entire-

entirely consumed in the Nourishment of the Chick, before it be hatch'd, and very little of the *liquor amnii* is left at the Birth of the Child.

Upon the Whole, may we not from a just analogical Deduction conclude, that the *liquor amnii* in which the Fœtuses of viviparous Creatures swim, serves for the same useful Purposes, as the *albumen ovi* in the oviparous Kind; and that both are carried to their proper Young in the same Way, that is by the Mouth?

Sed meliores meliora dicant.

XIV. *Two Examples of Children born with preternatural Conformations of the* Guts, *by Mr.* James Calder *Junr. Surgeon in* Glasgow.

I. About a Year ago I was sent for to visit a new-born Child that had a large Share of its Intestines lying without the Teguments of the *Abdomen*; I at first imagined the containing Parts had been torn in the Birth, but upon Examination found the Navel intire, and a Perforation half an Inch above

above it, thro' which the Guts had fallen out, with the Skin cloſely united to them. The Child ſeem'd otherwiſe to be as lively and Brisk as any new-born Infant uſes to be, and for 12 or 14 Hours it received Milk and Syrups by the Mouth, without any Appearance of Uneaſineſs; but after that Time it vomited every thing till its Death, which happened four Days after, and all the while it had no Paſſage by the *Anus*. The Guts which were inflated, and had no periſtaltick Motion that I could obſerve, gradually inflamed, and before the Child died, were become perfectly black.

When the Belly was opened after Death, I found that the *Jejunum*, all the *Ilium*, and Part of the *Colon* with the *Cæcum* had got out; the Parts of the *Jejunum* and *Colon*, which were engaged in the Perforation, were at that Place ſo ſmall, as ſcarce to allow a Gooſe-quill to paſs in their Cavity, they were adherent to each other, and had no Appearance of a Meſentery.

All the other *Viſcera* were ſound.

The Mother could not remember ever to have been ſurpriſed, frighted or hurt during all the Nine Months of her going with Child.

II. About the ſame Time that I had the Opportunity of obſerving the former Caſe,

I viſited another Child, which lived full ſeven Days after the Birth, in which Time it had never voided any *Fæces per anum*, but vomited every thing it ſwallowed; which did not appear to have any Mixture of *Meconium*, Bile, or any other coloured Subſtance.

The Parents, who were both healthy and ſound, having formerly loſt ſeveral Children with the ſame Symptoms, deſired me to examine the Body of this Child, to diſcover the Cauſe of their Death.

The Stomach was in good Condition, but the *Pylorus* was very hard, and felt as if it contained ſome other Subſtance, which appeared upon opening of this inferior Orifice of the Stomach, to be a glandular-like Piece of ſolid Fleſh, ſo cloſely adhering to the *Pylorus* all round, that there was no ſeparating of it, and without the leaſt Perforation in it any where; ſo that the Paſſage was quite ſhut up. Below this, the *Duodenum* was divided into two; and the Gut continued thus divided to about one third of an Inch above the *Jejunum*. Into the largeſt of theſe *Inteſtinula* the biliary Duct opened.

All the Inteſtines below were diſtended with Air, and only a very ſmall Quantity

of

of *Meconium* was to be seen near the *Podex*.

The other *Viscera* were all sound.

XV. *A Wound of the Neck with uncommon Symptoms, by Mr.* JOHN KENNEDY *Chirurgeon-Apothecary in* Edinburgh.

CAPTAIN *Robert Jackson*, Commander of the *Sorlings* Man of War, betwixt 40 and 50 Years of Age, of a healthy Constitution, and of a sober Life, was wounded in a Sea-fight, on the right Side of the Thyroid Cartilage by a Bullet, which I discovered by the Probe to pierce below the *Mastoid* Muscle. I dilated the Orifice of the Wound, and dressed it up with warm *Ol. Catellor.* and applyed a Compress moistned with *Sp. V.* to the Neck, keeping all on with a Bandage.

Next Day I carefully searched for the Bullet, and at last felt it a little above the superior *Costa* of the *Scapula*. I cut thro' the Teguments and *Trapezius* Muscle, and extracted two Bullets of a Musket Size each, that had been cast together, and were

were joined by a ſmall Neck. I blooded him, kept his Belly ſoluble with Clyſters, allowed him a ſpare cooling Dyet, and endeavoured to promote the Digeſtion of the Wound in the common Way.

The Wounds cicatrized in five Weeks, without any thing remarkable in their Cure, except that when the Slough of the anterior Orifice caſt off, the Breadth of a Herring Scale of the *Thyroid* Cartilage was laid bare, and appeared as white as Ivory, and incarned without any apparent Exfoliation. But there were ſome other Circumſtances attended my Patient, which ſeem to me remarkable, and induce me to ſend you the Caſe.

No Hæmorrhage happened during the whole Cure, notwithſtanding the Bullet paſſed thro' among ſo many large Veſſels as ly behind the *Sterno-maſtoid* Muſcle.

Immediately upon the Patients receiving the Shot, his Right-arm, from a little below the Neck to the Finger-Points, became pale, quite cold, and benummed, for which I bathed it with aromatic Fomentations, rubbed it well with ſtrong Spirits, in which alſo a double Rag was dipped and laid over the Arm, with red Bays to cover all. In about 12 Hours after, the Arm recovered ſome Heat; but the Thumb of that Hand was ſeized with a violent Pain, which kept him

him all Night from Sleep; and the next Day the Pain was ſo unſupportable, that he was in Danger of turning delirious, tho' his Pulſe was ſcarce quicken'd, and he had no Thirſt or other Sign of Fever. I again let him Blood, injected Clyſters, and applyed emollient and Anodyne Fomentations and Cataplaſms to the Member, without any Succeſs or Abatement of the Pain. The Torture he was in obliged me to have Recourſe to ſome Gutts of *liquid Laudanum* that Night, which did not cauſe Sleep, but freed him from Pain till next Morning, when the Pain returned as violent as ever, and continued ſo till the Doſe was repeated, which had the ſame good Effects as formerly; but the Pain returned as regularly next Morning as it had done before. The third Night I increaſed the Quantity of *Laudanum*, and thereby procured him Sleep.

Finding by repeated Trials that the Opiat effectually gave him Eaſe, I not only continued his Evening Doſe, but gave him a ſmaller one in the Morning, by which he was tollerably freed from Pain. As the *Opium* became familiar to him by long Uſe, it had leſs Effect on him, therefore I gradually augmented the Quantity, till after ſix or ſeven Months, his ordinary Doſe came

up

up to 250 Drops of *laud. liquid.* In the mean Time a great Variety of Fomentations, bathing in warm Milk, thruſting the Member into the reeking Bellies of ſlaughtered Animals, *&c.* were tried, but none of them did any Service.

Two Months after he had received this Wound, not only his Thumb was pain'd, as already deſcrib'd, but ſuch another Pain was felt at the Joint of the Elbow, without either Swelling or Hardneſs in the pained Parts, or in the Parts between them, and the Fore-arm remained free from Pain.

At the End of ſeven Months theſe Pains began to abate; in Proportion to this I diminiſhed the Quantity of *Laudanum:* But as the Pain became leſs uneaſy, the Feebleneſs of the Member increaſed; and in twelve Months the Pain was gone, and the Uſe of the Arm was intirely loſt.

About two Years and a Half after receiving this Wound, he went to *Bath*, and uſed the Waters there for a Seaſon; when I ſaw him after that at *London*, he told me he had recovered the full Uſe and Strength of his Arm.

XVI. *An Account of a large* Bone *extracted from the lower Part of the* Gullet, *by Mr.* JOHN STEDMAN *Surgeon at* Kinross.

IN *March* 1731, *William Angus* a strong young Man, Servant to *John Henderson* Farmer in *Wood of Coldrain*, near *Kinross*, hastily swallowed a large Piece of the Bone of a Cow's Head, in a Spoonful of Broath: He made strong Efforts to force it down to his Stomach, and was almost strangled before he swallowed it as far as an Inch and an half above the *Xiphoid* Cartilage, where, but towards the left Side of his *Thorax*, he complained of a most violent acute Pain. About 24 Hours after, he walked a Mile to have my Advice, but in such Torture, that when I saw him, he could scarce either sit down or stand. He had eat none from the Time of this Accident, and with the greatest Difficulty could sip down any Drink, tho' his Thirst was great. He complained much of Sickness, and his Pulse was quick.

The Difficulty he had to allow any Drops of Liquor to pass into his Stomach, made

made me deſpair of bringing away this Bone by Emeticks; which, if they did not ſucceed, would undoubtedly make his Caſe more deſperate. I was alſo of Opinion, that attempting to puſh it down into the Stomach, by thruſting a Sponge faſtned to a Piece of Whalebone down his *Oeſophagus*, would have no good Chance to relieve him, becauſe of the ſtrait Paſſage where the Gullet paſſes through the Diaphragm, which would be ſtill more ſtraitned by the preſent Irritation; and I could not promiſe what Effects the Bone might produce, after it was lodged in the Stomach.

Theſe Objections to the common Methods made uſe of in analogous Caſes, induced me to attempt an Operation that I do not know is deſcribed by any Author, which was the extracting it by the Mouth. For this End I cauſed make a long Rod of flexible Steel, and then bended each End of it into an oblong Round, terminating at the Extremity in a ſmall Button. This Inſtrument I thruſt down the Gullet, below the pain'd Part, and then gently drew it up; which Operation I was obliged to repeat fifteen Times, turning the Inſtrument ſometimes to one Side, and then to the other, endeavouring to engage the Middle of the Bone in the Hook. Every

Time I introduced the Inſtrument he had a reaching to vomit, and always brought up a little Blood with ſome other Liquors. At the laſt Attempt, which was an Hour after I had begun the Operation, I was lucky enough to bring the Bone away, which, with the Inſtrument then uſed, I herewith ſend you.

Tab. III. *Fig.* 1. ſhows the Shape of the Inſtrument, and *Fig.* 2. repreſents the Bone of the natural Bigneſs.

Immediately after the Extraction, he complained much of Pain in his Throat and Breaſt, and continued, as he ſince told me, to be ſo much pained for a Fortnight after, that he ſwallowed even the ſofteſt Spoon-meats with exceſſive Torture, was coſtive in his Belly, had a Thirſt, found his Pulſe going ſwift, and was very ſick, but walked about. On the 14th Day he thought to have died with Pain; after which he daily became eaſier, without either vomiting or paſſing by Stool any thing like *Pus*, but obſerved that the hard Stools he had were of a dark red Colour. At the End of twenty Days he was quite free of Pain, and he has continued in perfect Health ever ſince.

XVII. *An*

XVII. *An uncommon Tumor of the Breast, by Dr.* PETER PATON *Physician at* Glasgow.

A Woman about 38 Years old, and to Appearance of a good Habit of Body, shewed me a Tumor which had been three Months in her left Breast; it was, to the Touch, as hard as a Stone, painful and red all round, and protuberant in the middle. The Woman notwithstanding the Trouble of it, continued at her Work, having the Tumor covered with a *Diachylon cum gummi* Plaister. By Degrees the Tumor turned softer, and at length a small Suppuration appeared on the most protuberant Part. Six Months after I first saw her, as she was reaping Corn in the Fields, this suppurated Part broke, and a large Bag fell out at the Orifice, which she immediately brought me.

The Ulcer in the Breast cured in a little Time, by washing it Morning and Evening with Brandy, and applying some *Ung. Basilic.* to it.

The Bag that fell out of it was composed

of several membranous Coats, the external of which was white and opake, but the more internal were all pellucid; on the Surface of the most internal I observed two very small Caruncles.

The Liquor contained in this *Cystis*, to the Quantity of seven or eight Ounces, was clear and transparent like Water, but a little fetid to the Smell and bitter to the Taste.

XVIII. *Improvements in performing the Operation of the* Paracenthesis, *or Tapping of the Belly, by* Alexr. Monro, *Professor of Anatomy in the University of* Edinburgh, *and* F. R. S.

THE Place where Chirurgical Writers determine the Perforation to be made with the *Trocar* in tapping the Belly, is four or five Inches below, and as much to a Side of the Navel, or the Point where a Line at that Distance from and parallel to the *Linea alba* would be intersected by another Line drawn perpendicular to the *Linea alba* at four or five Inches below the Navel. If this Point is supposed to be determi-

termined on a healthy Man of middle Growth and Stature, it certainly is a very ſafe and convenient Place for making the Puncture, for it is ſufficiently dependent, eſpecially when the Perſon lies on the ſame Side, there are no thick fleſhy Bellies of Muſcles to pierce, nor are the Muſcles intirely tendinous, but are become tendineocarnous; and at this Place there are no large Blood Veſſels or Nerves in Hazard of being wounded: All which Advantages no other Part of the *Abdomen* has. But then, this Rule of meaſuring four or five Inches is certainly not to be applied to hydropick People, as being very precarious, and conſequently very often dangerous, for tho' the Diſtance is taken in full Meaſure when the *Abdomen* is diſtended, yet when the Belly ſubſides, the Perforation will be found nearer to the Navel in Proportion to the Degree of Diſtenſion; as for Inſtance, ſuppoſe that the anterior Part of the *Abdomen* is diſtended by Water to double its natural Length and Wideneſs; that when the Water is drawn off this Cavity is contracted to its natural Size; and that all the Parts have been equally ſtretched and are again equally contracted; then, tho' four Inches were taken both Ways from the Navel, it is plain that after the Contraction

the Diſtance each Way will be but two Inches, ſo that the Perforation is not depending enough, the *rectus* Muſcle is pierced, and probably ſome of the larger Branches of the epigaſtrick Veſſels are wounded.

What undoubtedly is meant is, to make a proportional Allowance for the Quantity of Diſtenſion, and ſome Authors have ſaid ſo much; but none of them except *Garangeot* have laid down any other general Rule for chuſing the Place of Tapping, he indeed ſays (*a*), that the Puncture ought to be made in the Middle between the Navel and Spine of the *Os ilium*; but as this *Spine* is of a conſiderable Extent, his Rule is much too uncertain, eſpecially conſidering that the preciſe Point to be pierced can be determined in all Subjects and different Degrees of Diſtenſion which the Belly ſuffers in Dropſies, by only remarking that in a ſound State a Point four Inches below and to a Side of the Navel is the Middle betwixt the Navel and anterior ſpinal Proceſs of the *Os ilium*, and that the muſcular Parts of the *Abdomen* are near equally ſtretched in the *Hydrops Aſcites apertus*; whence it follows, that this middle Point be-

(*a*) Traitè des Operations du Chirurgie, Tom. I. Chap. 6. Art. 1.

between the Navel and this ſpinal Proceſs is invariable or near ſo, and therefore is the Part where the Perforation ought always to be made in Tapping.

Till of late that Dr. *Mead*, by preſſing on the *Abdomen* with an Aſſiſtant's Hands while the Water of the *Hydrops Aſcites* was evacuated, diſcovered the ſudden taking off the Preſſure from the deſcending *Aorta* in ſuch Subjects as ſcarce have Blood enough to fill the Veſſels of the Body, to be the true Reaſon of the *Syncope*, Inflammation and great Diſtenſion of the Veſſels of the abdominal Bowels, and particularly of the Inteſtines; Surgeons were very careful to draw off a ſmall Quantity of Water at once, and rather choſed to repeat the Operation more frequently, tho' they were ſenſible at the ſame Time of ſeveral Diſadvantages attending their Method; for beſides the Pain and Uneaſineſs to the Patient, and the Danger Orifices made any where in the Teguments of hydropick People are in of mortifying, the Guts ſtill loſe more of their Tone by ſoaking longer in Water, the Air being neceſſarily admitted by the *Cannula* into the Cavity of the *Abdomen* is liable ſometimes to rarefy, diſtend the Belly and form a *Tympanites*, and never miſſes to haſten the Putrefaction of the Water,

Water, from which a Train of various bad Symptoms must follow.

All these evil Consequences might then be prevented by drawing of all the Water at once, and preserving the Pressure still on the Belly, which can be supplied by Art, but ought for greater Safety to be done gradually and equally as the Water runs out, which neither the pressing with Hands in Time of the Operation and applying a Bandage afterwards, which is the Practice in *England*, nor the swathing with a Towel immediately afterwards, as I have seen done in the Hospitals at *Paris*, are rightly calculated for, and therefore these several Years I have always used a Belt, of the Form in *Tab.* III. *Fig.* 3. made of fine Flannel covered with strong Linnen. The Body of the Belt A is only so wide as to reach from the Spine of the one *Os ilium* to that of the other; to one End of this Body strong Tapes or Ribbons B are sowed at a little Distance from each other, and to the other End as many well polished Buckles C are put: Near the inferior Side of the Belt, and at a small Distance from each End, a little Window D E is cut, which can be shut with two Buckles G, and Straps F.

When the Operation of the *Paracenthe-*

sis

ſis is to be performed, I mark with Ink the middle Point between the Navel and Extremity of the Spine of the *Os ilium* of the Side which I deſign to pierce; then I apply the Belt with the Flannel Side next the Skin, well charged with Fumes of *Benzoin*, *Maſtich*, and ſuch other drying and corroborating Medicines, taking care that the Point of the Skin formerly marked with Ink ſhall be in the Middle of one of the Windows or Openings of the Belt; after which a Linnen Compreſs is put on the Back, to defend it from being hurt by the Buckles: And laſtly, the Straps or Tapes are put through the Buckles and drawn a little tight, by which the Water is preſſed in greater Quantity to the Part of the *Abdomen* where there is the leaſt Reſiſtance, which will be the Part uncovered by the Belt, or the open Window, and therefore that Part becomes more prominent and tenſe, which facilitates the Perforation, and makes a greater Diſtance there between the containing Parts and *Viſcera*, and conſequently makes leſs Danger of the Guts, *&c.* being wounded by the Point of the *Trocar*.

Gradually as the Water is drawn off, the Straps are pulled ſtraighter, and if the Patient will be ingenuous, the ſame Preſſure

can

can be kept on the *Abdomen*, all the Time of the Operation and after the entire Evacuation, as was on it before one Drop of the Water was taken away; becauſe the Operator has a very certain Gage, the Breathing, to judge by; for the Difficulty of breathing which hydropick People labour under being wholly the Effect of the Water preſſing the *Diaphragm* upwards, and thereby ſtraitning the Lungs, any Force equal to that of the Water preſſing all the Parts of the *Abdomen* equally will have the ſame Effect: For this Reaſon the Patient muſt from time to time acquaint the Surgeon if he is ſenſible of his breathing more freely, when the Straps are to be drawn tighter, till the Patient judges the Difficulty of breathing to be the ſame as it was formerly. In this way I have drawn off more than once from very feeble emaciated Patients ſixteen *Scots* Pints, or ſixty four Pounds of Water at once, without the leaſt Faintneſs or Uneaſineſs.

After all the Water is evacuated which is greatly aſſiſted by the Preſſure, a Pledget and Plaiſter are to be put on the Orifice from which the *Cannula* was taken in the common Way; and a Compreſs being applied over theſe, the Window is to be ſhut on this, and brought to the ſame Tightneſs with

with the reſt of the Band. At Pleaſure this Window can be opened and ſhut and the Wound can be dreſſed, and the whole Belt may as Occaſion requires be ſlackned or ſtraitned.

In Tab. III. *Fig.* 3. *this Belt is repreſented.*

A. Its Body.
B. The Straps.
C. The Buckles.
D. The Window.
E. The Part of the Belt that cloſes up the Window.
F. The ſmall Straps.
G. The little Buckles.
H. The Window ſhut up.
I. The Straps and Buckles.

The Belt juſt now deſcribed is what I have only made Uſe of hitherto, but have ſometimes been ſenſible of Inconveniencies in applying it when the Belly is very greatly diſtended, for in ſuch a Caſe the *Oſſa innominata* keep the Belt from being right applied to the lower Part of the Belly, which is ſtretched down over the Patient's Thighs; the ſuperior Part of the *Abdomen*, being conſiderably ſmaller than the lower, is not ſufficiently ſtraitned; and after the Operation is finiſhed, the Belt is liable to be gathered all in Wrinkles round the Loins, eſpecially if the Patient is reſtleſs and careleſs.

To

To prevent these Inconveniencies, I think a further Improvement may be made to the Belt: See *Tab.* III. *Fig.* 4. Let a slanting Flap K be added to its inferior Edge; from which let two Straps L L with Buckles at their Extremities go out to pass between the Patient's Thighs, and to be fastned to other Straps M M which come out from the upper Edge of the circular Band, or to a scapular Bandage brought over the Patient's Shoulders: It is evident that the Flap K will compress the hypogastrick Region which the circular Belt could not reach; and that the additional Straps being tightly drawn will keep the circular Band stretched at its full Breadth.

XIX. *Worms evacuated at an Ulcer of the* Groin. *By Mr.* James Douglas *Surgeon to General* Sabine's *Regiment.*

While the Regiment I have the Honour to serve in was quartered at *Portsmouth* in *September* 1731, a Woman belonging to it was taken with Gripes, Vomiting

miting and Coſtiveneſs, which continued five Days notwithſtanding all I could adminiſter; but at laſt by the frequent Uſe of lenient Clyſters ſhe had ſome Stools, which eaſed her Gripes in a ſmall meaſure, the Vomiting ſtill continuing, with ſeveral Symptoms which ſeemed hyſterical; wherefore I gave her internal, and applied external Medicines for this Intention.

On the eighth Day of her Illneſs ſhe vomited a Worm of the *Teres* kind about a Foot long, whereupon the Complaint of her Stomach abated, her Gripes ſtill continuing, yet not ſo violent as at firſt: She now informed me of a *Tumor* ſhe had above a Year and a half in her right Groin; ſhe would not allow me to ſee it, but told me it was as big as a ſmall Hen's Egg, and by gentle Preſſure with her Hand receded, and never gave her any Pain till now. I judged this *Tumor* to be a *Hernia*, and adviſed the Application of an *Empl. ad Herniam* with Compreſs and Truſs, which ſhe thought eaſed her about three Days.

When I viſited her the fourth, the Pain was much increaſed and ſhe felt a Pulſation in the *Tumor*; I then prevailed on her to let me ſee it, and was ſurpriſed to find a large inflammatory *Tumor* tending to Suppuration, without any Swelling of the inguinal

guinal Glands: Her other Complaints in the mean time abated, from the Uſe, as I think, of the following *Bolus*, which ſhe took Morning and Evening ever ſince ſhe vomited the Worm; ℞ *Æthiop. mineral. Gr.* xxiv. *Calomel. Gr.* iii. *Conſerv. Roſ. rubr. q. s. ut fiat Bolus.*

I applied a ſuppurative Cataplaſm two Days, and on the third, which was the fourteenth of her Illneſs, opened the *Tumor* with a Cauſtick in the common Way, and diſcharged near four Ounces of a ſerous like Matter; I then dreſſed the Ulcer with ſome *red Præcipitate*, and Pledgets covered with *Ung. Baſilic.* with which a little *Ol. Terebinth* was mixed; over theſe I put a Compreſs wet in tepid *Sp. V. camphorat*, and kept all on with the T Bandage: After three Days dreſſing in this manner the Inflammation and Tumefaction, which had extended from the *Mons Veneris* to the anterior ſpinal Proceſs of the *Os ilium*, were much abated, the Diſcharge from the *Ulcer* was ſmall, and the Matter was leſs fetid and better digeſted, whereas at firſt the Sloughs that were taken off were ſo fetid I could ſcarce bear the Smell of them. Finding the Ulcer now ſufficiently cleaned I dreſſed with common Digeſtive only, and it ſeemed to be in a fair way of healing very

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ry faſt, without any Accident till the twenty third Day, when being now ſo ſtrong as to ſit up, I had given her this Cathartic in the Morning, ℞ *Decoct. ſenn. Unc.* iii. *Tinctur. ſacr. Drach.* ii. which wrought her pretty well, and coming to dreſs her about three in the Afternoon ſhe ſhowed me a Worm about five Inches long, of the *Teres* kind, which ſhe told me had come out of the Ulcer; and that ſhe had forgot to inform me of ſuch another having come away two Days after my opening the *Tumor*. Upon taking off the Dreſſings, I ſaw the Corner of the Ulcer next the *Os ilium* bloody, and ſearching there with my Probe penetrated into the *Abdomen*; which made me reſolve to keep the Ulcer open for ſome Time, to allow a Paſſage to any other of theſe Creatures that were to be diſcharged. That ſame Evening her Husband brought me another Worm of the ſame kind and ten Inches long, which had come out of the Ulcer as the Patient was ſitting at the Fire-ſide.

On the twenty ſixth I repeated her Phyſick, with the Addition of *Pulv. Jalap. Gr.* viii. which gave her three Stools, and all Day there was a Diſcharge from the Ulcer, like the Juice of Leeks, which ſeemed to differ from what ſhe paſſed by Stool on-

ly in being of a darker Colour. This excrementitious Diſcharge accompanied ſometimes with Wind continued ſome Days longer from the Ulcer, the Patient having alſo a Stool in the natural Way every Day.

The Diſcharge at the Ulcer decreaſed gradually till the thirty third Day, when nothing but laudable *Pus* was to be ſeen on the Dreſſings; and in a Week more obſerving no Return of the Excrements this Way, I endeavoured to cicatrize the Ulcer, which was done in a few Days by applying *Turner's Ceratum de lapide calaminari*; in the mean time I took care to keep her Belly orderly, without allowing her to be coſtive, or purging her.

She remained perfectly well above a Month, when a very ſmall Hole broke out in the *Cicatrix*, and diſcharged the thinner Part of the Excrement, but without any Pain or Hindrance from her Buſineſs. It has remained in this Condition ever ſince, with only a very ſmall Quantity of ouzing Matter, notwithſtanding her riding two hundred Miles; and I believe ſhe muſt ever be contented to dreſs it daily with Digeſtive or the *Cerat*, according to the different Circumſtances of the Sore.

XX. *A Mortification of the Guts in a* Hernia *cured, by Mr.* JAMES JAMIESON *Surgeon in* Kelso.

IN the middle of *December*, a vigorous labouring Man of 28 Years of Age, who lives three Miles from *Kelso*, was seized with a violent Cholick, for which he got next Day a purgative Medicine from a Gardner that operated very well, but without removing his Pain. The Day following a large Swelling appeared in the Right Groin and right Side of the *Scrotum*, on the middle Part of which a Mortification about the Dimension of a Shilling was observed the second Day after; and on the third, the mortified Part fell off; and was followed by a large Discharge of Excrements at the Orifice, upon which all his Pains ceased.

The first Time I visited him was the seventh Day of his Sickness, when he was free of Pain and Fever; the Tumor of both Groin and *Scrotum* were entirely gone, without any one's having made an Attempt to reduce the Gut, which certainly by its

Deſcent had formed the *Hernia*. His Excrements came out in great Quantity at the Opening made by the Gangrene, and a grumbling Noiſe of Wind was heard in his Belly. In handling the *Scrotum* I could not feel the right Teſticle, nor has it ever been felt ſince, tho' the Patient is poſitive he had it before this Diſeaſe attacked him. I enquired at all the People who attended him, concerning the Quantity of rotten Fleſh that had been caſt off, but could receive no Information; all of it having been thrown out undiſtinguiſhed from the Excrements.

I cauſed carry him to this Place next Day, and brought all the Phyſicians and Surgeons here to adviſe his Caſe. In the Conſultation it was determined to inject warm Claret Wine at the Orifice Morning and Evening; and to keep conſtantly on the Part a Compreſs dipped in the ſame Liquor, over which a four-tail'd Bandage ſhould be applied: The Patient to be confined to his Bed; to be allowed only a Milk Diet, and to adminiſter every Day a Clyſter compoſed of a Decoction of the Emollient and ſome vulnerary Plants, in which Turpentine, lenitive Electuary and Oil were diſſolved.

This Method ſeemed to ſucceed well for

ſome

ſome Time, the Quantity of Excrements paſſing at the Groin gradually decreaſing, and the Evacuation by the *Anus* being proportionally increaſed; whereas the largeſt Share of the *Fæces* were formerly voided at the preternatural Orifice, and no bad Symptom appeared till the 12th Day, when no *Fæces* coming by the Groin during twelve Hours, he was ſeized with ſharp Pains in the umbilical Region, attended with continual Vomiting and *Singultus*, with Tremors like thoſe of an Ague, Cold Sweats, and a low frequent Pulſe.

At the firſt Appearance of theſe dreadful Symptoms, I let Blood of him plentifully, injected a laxative and emollient Clyſter every three Hours, fomented his Belly with a warm emollient *Fotus*, and made him frequently ſwallow Spoonfulls of an Anodyne cordial Mixture. Having uſed theſe near twelve Hours, the Patient evacuated ſome hardned Excrements at the Groin, the Symptoms began to abate, and gradually went off.

When the bad Signs were all gone, we put him again on his former *Regimen*, but mixed ſome *Mel Roſar.* with the Claret that was uſed for the Injection, continued to foment his Belly twice a Day; and in the Time between the Fotuſes, covered his

Belly with an Emollient, and gently aromatic Cataplaſm. We alſo added Carminatives to the Clyſters.

From this Time the Diſcharge at the Rings of the Muſcles daily diminiſhed, and after ſix Weeks nothing appeared on the Clothes except a ſmall Quantity of *Ichor* that had no Smell.

I ought to obſerve, that no Part of the Clyſters ever came out at the Orifice of the *Scrotum*, and that none of the Injection could be obſerved among the *Fæces* which he paſſed the natural Way.

A very little Quantity of the *Ichor* is ſtill diſcharged from ſo ſmall an Orifice of the *Scrotum*, as will not admit a Probe. But there is no Fullneſs nor Hardneſs; his Excrements come regularly the natural Way, and he is otherwiſe in perfect good Health, having herded Cattle theſe ſeven or eight Weeks paſt: I have however cauſed him wear a Truſs by Way of Precaution.

This Paper was ſent us ſeveral Months ago, and we have been lately informed by the Author of it, that this Patient has remained in perfect good Health, has no Diſcharge at the Ulcer, nor Occaſion for a Bandage ſince a Week or two after the Caſe was ſent us.

XXI. *Stones*

XXI. *Stones in the Kidney, with Remarks on the Operation of* Nephrotomy, *by Mr.* JOHN DOUGLAS *Surgeon in* Edinburgh.

——— Aged 53 Years, of a robuſt Make of Body, having large Muſcles, and remarkable big Blood-Veſſels, the Veins of his Arm at the common Blooding-place being to Appearance an Inch in Diameter, was afflicted, ſince four Years old, with a violent Pain in his Right-ſide about the Region of the Kidney, from which he never was at any Time perfectly free; but he often had tolerable Intervals; otherwiſe he was very healthy.

In his younger Days he was ſalivated by Dr. *Pitcairn*'s Order, and had many different Advices from ſeveral other Phyſicians, but ſeldom got Relief from any Thing, but the drinking large Draughts of warm Water, even to the Quantity of three *Scots* Pints (12 *Pounds*). He more than once ſuffered ſuch violent Pain for ſome Months, that he was obliged to ly the whole Time on a Coverlet laid on the

Floor; the Pressure of his pain'd Side on the hard Floor giving him some Remission from Pain. While the Pain continued, all the Urine he passed, after it had stood and cool'd a little, became like Gleet, or Whites of Eggs. He had often a *Diarrhæa*, without any Gripes, and cou'd at Pleasure even then refrain going to Stool for a whole Day. And in the same Way he could retain his Urine, till his Bladder was so full, as to discharge near three Chopins (*6 Pounds*) at once. Several Meats and Drinks, such as Eggs, Butter, fry'd Meat, Punch and white Wine gave him Pain, small Malt-Liquor rather eased him, for which Reason he for ordinary drank plentifully of it.

About the Beginning of *February* 1731, he contracted a violent Cough, which brought on a Consumption, of which he died, *March* 29th thereafter, tho' by all Appearance before that Time, his Lungs were in exceeding good Condition.

I was allowed to open his Body before Dr. *Robert Lowis* and Mr. *John Wallace* Surgeon; and having always been of Opinion that there was a Stone in his Right Kidney, I resolved first to imitate the Operation called by Authors *Nephrotomy*, which is said to have been performed successfully by *Dominicus de Marchettis*; but I met with

with such Difficulties, as gives me great Reason to wish that either *Marchettis* had given us the Account of it; or that the previous Symptoms of *Consul Hobson* had been set down, whereby we might be certain of the Stones having been cut out of the Kidney its self; and all Suspicion might have been removed of its having already made its Way thro' the greatest Part perhaps of the containing Organs. The Difficulties I mean are the Thickness of the common Teguments and Muscles which was in this Body no less than 3 ½ Inches. When the *Peritoneum* was laid bare, I observed the *Colon* betwixt it and the convex Surface of the Kidney; after that Gut was removed, a large Nerve presented itself, lying just across the Place where the Kidney ought to have been cut. And the Depth of my Incision was now so great, that I found it impracticable to penetrate through the Substance of the Kidney into the *Pelvis*; and therefore I turned the Body into the common supine Posture; and opening the Kidney in the ordinary Way of Dissection, I took out the two Stones herewith sent. See *Tab.* III. *Fig.* 5, 6. The largest, *Fig.* 5. weighing half an Ounce, was found in the *Pelvis*. The Figure of it you see is triangular, with its Surface

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stuck full of small *Granula*, as big as *Coriander*-Seed, which seem to have been united after the Stone has been formed; for they were of different Hardness and Colour, being black, whereas the Surface of the Stone below them is brown and firmer. The lesser Stone, *Fig.* 6. which weighed 16 Grains, and is of an irregular square Figure, was lodged in the Substance of the Kidney. Besides these two, there were a great many other small stony Concretions dispersed every where in the *Tubuli uriniferi*; many of these were bigger than the largest Grains of Sea-Sand.

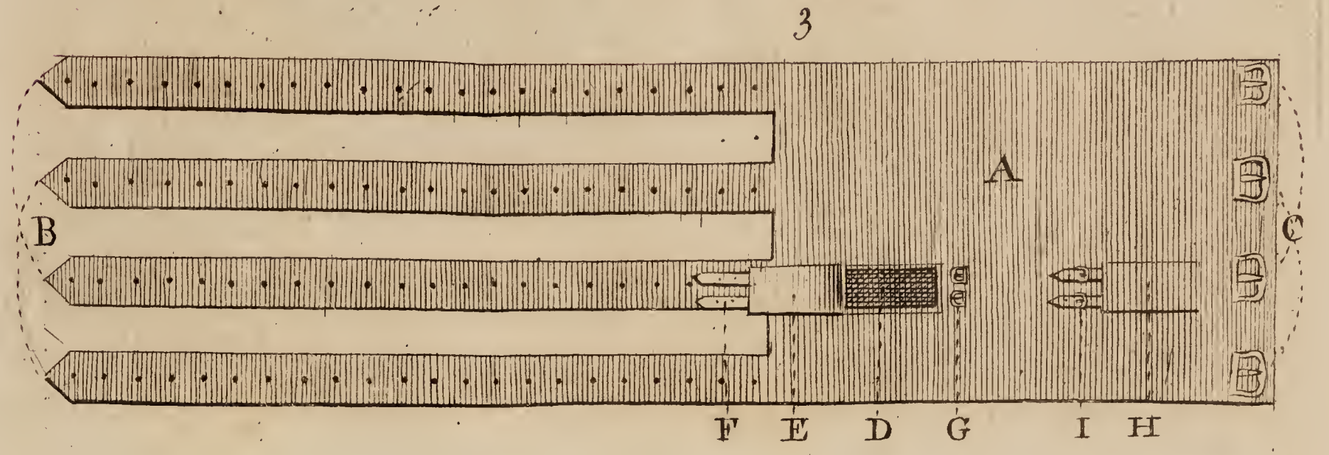
XXII. *An Anomalous Tumor of the Leg, unsuccessfully treated by* ——————*.

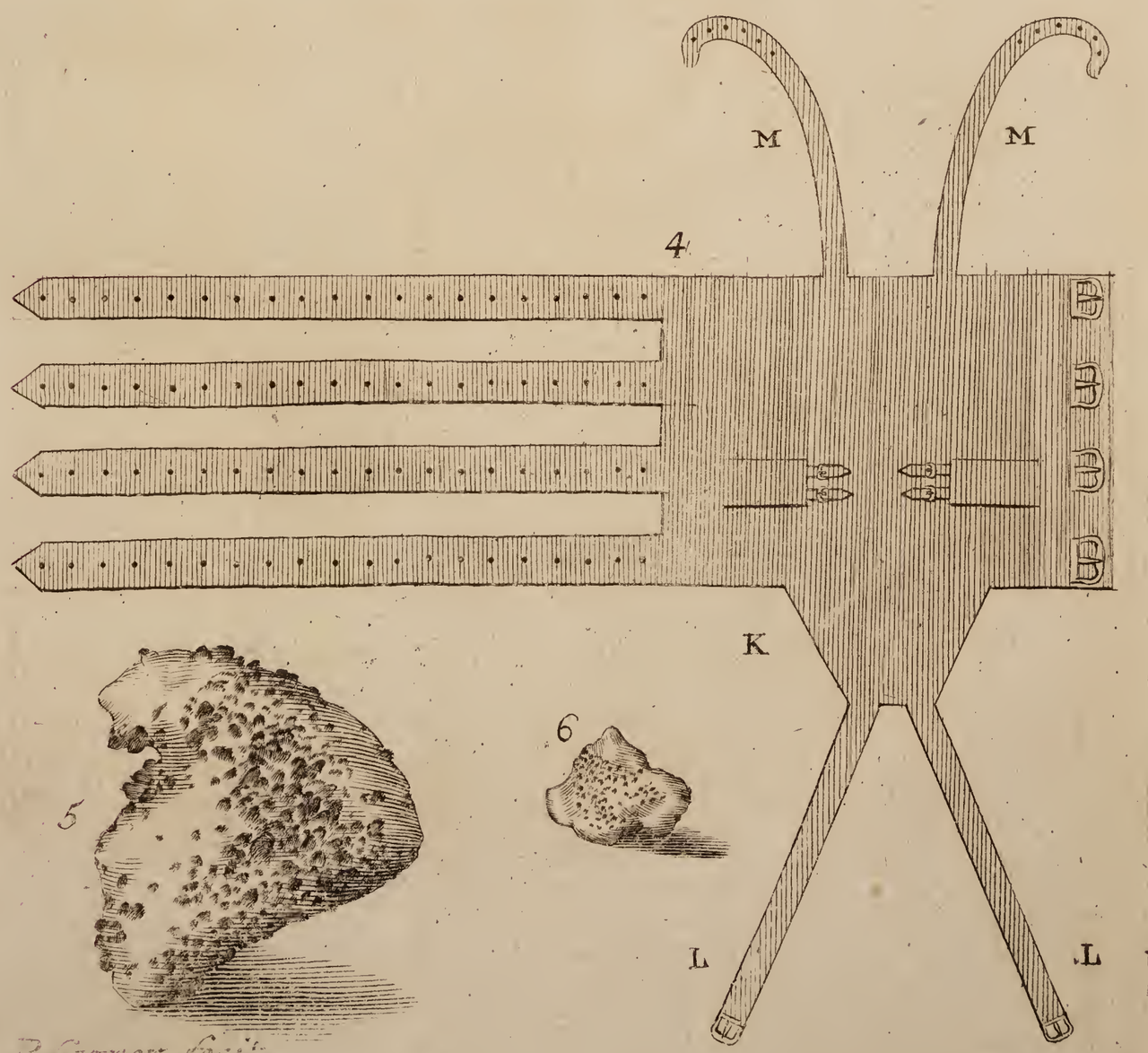
A Woman about Forty six Years of Age, after having been troubled several Months with a Tumor on the outside of her Leg, asked my Advice. The external Part of her Leg was equally swelled, only about the Middle it pointed, as we commonly call it, or was more prominent, red colour-

* The Author of this Paper having claimed the Performance of the Promise we made in our Proposals, we have complied with the Desire of his Letter, by suppressing his Name.

Tab III

Fig. 1





B. Geyer sculpt.

Next Day I brought two Surgeons in my Neighbourhood to visit my Patient, and having taken off all the Dressings except the Pledgets which covered the Orifice. I desired them to feel the Swelling, and give me their Opinion of it. They both affirmed their having felt the Fluctuation of Matter under their Fingers. When the last Pledgets were taken away, a *Fungus* appeared at the Orifice, which resembled the flabby *Tunica cellulosa*, so often to be seen in the Back and other depending Parts of those that dye of tedious lingring Diseases. I cut off some of this *Fungus*, put gentle Escharoticks on the Remains of it, and dress'd the rest of the Wound with Suppurants. On the second Day the *Fungus* came out much larger, and violently stretched the Aperture of the Teguments and tendinous *Aponeurosis*, by which a Gangrene was begun all round the Edges, I cut off the *Fungus*, enlarged the Orifice considerably, and dressed it up with Antiseptick and Suppurants in the common Way. In two Days the gangrened Parts fell off, and the Aperture being now very large, I dissected from between the two Bones of the Leg, near a Pound of that flabby Substance. After having cut as deep as I durst, without risking the opening

of

of the large Arteries, I thruſt a Probe thro' that ſoft fatty Subſtance, till I felt it and ſaw it ſtriking againſt the Skin of the oppoſite Part of the Leg.

Expecting therefore no Succeſs from this Method, I reſolved to perform the Amputation as ſoon as the Fever and *Diarrhæa*, which were now come on, were abated; but neither were ſtopt by any Medicines given, and in a few Days the Patient died.

The Skin of all the Leg appeared after Death ſound, but the *Tunica Celluloſa* and Muſcles were all degenerated into that pappy Subſtance which had appeared as a *Fungus*; and I could not diſtinguiſh one Muſcle from another, tho' I was at Pains to diſſect them.

The *Perioſteum* was every where ſeparated from both *Tibia* and *Fibula*, and between it and the Bone, an acrid dark brown Liquor was contained; and the Surfaces of the Bones were rough and yellow.

I had Occaſion ſoon after to ſee a Leg affected with juſt ſuch another Sort of Tumor, but it was opened ſooner, before any other bad Symptoms had come on. It would not cure with either external or internal Medicines, and the Patient would not allow Amputation; ſo that it was palliated

liated, till both Surgeon and Patient wearyed of each other.

Pray Gentlemen, under what Class of Tumors is this to be reckoned? Is it a-kin to the windy Swellings of the Joints? Or to what the *French* call the *Fatty Tumors*.

If you know the Species of Tumor, what is the pathognomic Sign by which it is to be distinguished from *Erysepelas-oedematodes*, or the slow *Plegmons*; for I am much afraid of falling into some such Mistake as the former, unless you'll explain the Difference to me.

XXIII. *The larger Share of the* Tibia *taken out, and afterwards supplied by a* Callus; *by Mr.* David Laing *Surgeon at* Jedburgh.

A Girl in the Parish of *Maxton*, about seven Years old, who never had any Disease except the Small Pox, accidentally hurt her Right-Leg, and soon after, the Teguments on the fore-part of the *Tibia* swelled a little, but were not discoloured, till two Months after, when a Redness about the Breadth of a Sixpence appeared on the

the Skin, and an Ulcer soon followed, which made the Patient's Parents ask my Advice.

The Child was at this Time much decayed, her Flesh and Strength being wasted, and her frequent Pulse, great Thirst, and want of Appetite, with other Appearances of a hectick Disposition, made the *Prognosis* very indifferent.

I caused foment the Part well with Emollients, and applied Cataplasms of the same Kind: But finding no Advantage by the Use of these; and discovering by the Nature of the Matter that came out of the Sore; and by the Colour, Softness, *&c.* of the Flesh, Signs of the Bone's being affected, tho' it was not yet in Sight. I made a small Incision in the Teguments to lay the Bone bare, by which my Suspicions were fully confirmed.

I soon now saw that the Disease in the Bone extended farther than the opening of the Teguments; and therefore from Time to Time I enlarged the Incision, till I came to the Extremities of the affected Piece of Bone; which Method I rather chused to follow, than to hazard making at once in this feeble hectick Patient such a large Opening as would have been necessary.

I dressed the Sore with *Tincture of Myrrh,*

Myrrh, cauſed the Patient to take a Decoction of the Woods with a ſmall Quantity of *Aq. Calcis* twice a Day, and gave her an Antiſcorbutick and aperient medicated Ale for ordinary Drink.

After continuing theſe Dreſſings and Medicines about ſix Months, the Bone I ſend you was taken out. (See the Fore-view of it in *Fig.* 1. and the Back-view of it in *Fig.* 2. of *Tab.* IV.) You ſee it is the whole Body of the *Tibia*, the Length of the ſuperior Part of what remained towards the Knee, being three Fingers breadth, and the inferior Extremity towards the Ancle, being only one and a half long.

In ſix Weeks the Sore was cicatrized; and in a Month after, the Child began to walk before the *Callus* was ſufficiently hardened, which made it turn a little crooked, as it ſtill remains, but is otherwiſe ſmooth, and as hard and firm as any other Bone of her Body; ſo that ſhe walks, dances, leaps, *&c.* without the Aſſiſtance of a Crutch or Staff, and without the leaſt obſervable Halt.

Towards the End of her Cure, I gave her *Tincture of Antimony* to remove a dry Itch that was over her whole Body. A conſiderable Time after her Leg was ſound, a new Ulcer appeared on the ſuperior Part of the

the Arm, and now there are two ſharp Points of the *Os humeri* ſtanding out at the Orifice in the Teguments. This Attack on a Part that never received any Injury, makes me of Opinion that the Ulcer of her Leg was not occaſioned by a Hurt at School, which the Parents aſſign as the Cauſe of the Diſeaſe, but that it was rather owing to her bad Habit of Body.

Mr. William Carlyle *Apothecary in* Carlyle *favoured us lately with a Hiſtory of a Caſe very like to this; the Part of the* Tibia *which was taken out, is ſeven Inches long; the Boy to whom it belonged was twelve Years old; the Cure, which was almoſt intirely performed by Nature, was two Years in being completed; and there is no Inconveniency remaining except that the Patient cannot ſtretch the Heel of the Leg out of which the Bone was taken, ſo well to the Ground as he does the other.*

XXIV. *An ESSAY on Mr.* Garengeot's *good Manners and univerſal Learning, inſcrib'd to the Memory of Dr.* Friend, *by* ——— *Prentice to a Surgeon Apothecary in* Edinburgh.

Inops potentem dum vult imitari, perit. Phædr.

*IT is certainly juſt that, in Matters of Philoſophy, every one ſhould be at Liberty to give his Opinion and to redargue what others have advanced: But there is a certain Decency of Expreſſion which ought to be obſerved in all Diſputes, eſpecially when thoſe whom we undertake to refute are Men of at leaſt equal Character to ourſelves, and who have otherwiſe given good Proof of their Learning and Ingenuity, imployed

* This young Gentleman either miſunderſtands our Propoſals, or forgets the Promiſe in his Preamble, of *uſing no Expreſſion which might treſpaſs againſt the Rules laid down to our Correſpondents:* For we muſt think that he has not ſhunned offenſive Terms and perſonal Reflexions, even when he pretends to make great Compliments; and therefore nothing leſs than the Regard we have for the Memory of the learned Dr. *Friend* ſhould have prevailed on us to inſert this Paper. We Deſire no more ſuch may be ſent us, otherwiſe their Authors need not expect we will publiſh them.

ployed in the Service of the Publick; whoever tranſgreſſes in this Piece of prudent good Manners, cannot complain if he ſhould be attacked in his Turn with ſome Severity.

The Deſign of this Preamble is to introduce a few Remarks on an Author whom you ſeem engaged to take ſome Notice of, if I rightly underſtand your Propoſals; it is *Garengeot*, who in the Preface to the new Edition of his *Chirurgical Operations* in three Volums 12*mo*, warns us, that he is to cenſure ſeveral People, but aſſures us (*p.* 15.) "It is to be with good "Manners, and that Charity we owe one "to another." In his Book he appears to have quite forgot this Promiſe, particularly with Regard to an Author who is univerſally acknowledged to have been an accompliſhed Gentleman, a fine Scholar, and an Honour to his Profeſſion. 'Tis true Dr. FRIEND in part deſerved the Uſage he has met with from Mr. *Garengeot*, for ſtooping ſo far beneath himſelf, as to give Occaſion to the Diſpute.

The Doctor, alas! is no more; his Aſhes are inſulted, and none appears to vindicate the Injury, which has engaged me to ſend you this Paper, in hopes it may excite ſome other to treat Mr. *Garengeot* in a

Manner ſuitable to the Politeneſs of the following Sentences, (*p.* 404.) "*Voila* "*la ſeule conſideration qui m'a porté à* "*relever les VETILLES de Mr.* "Friend." And *p.* 428, "*Ainſi ſans* "*faire attention a des objections qu' un* "*Ecolier ſe fût bien guardè de faire.*" Theſe are very handſome Flouriſhes; "The "impertinent Trifles, or old Woman's "Tales of Mr. *Friend.* The Objecti- "ons of Mr. *Friend*, which a School-boy "would have taken great Care not to "make, or would have been aſhamed of. It would ill ſuit me, who can at preſent aſſume no other Character than of an *Ecolier*, to retort on a *Demonſtrateur Royal* in Language the leaſt of Kin to this; therefore in examining the Diſpute that has occaſioned theſe ſtrong Words; and in ſome more Remarks on Mr. *Garengeot*'s firſt Volume, I ſhall be greatly on my Guard to uſe no unbecoming Expreſſion, which might treſpaſs againſt the Rules laid down to your Correſpondents in your Propoſals.

Dr. *Friend* had ſaid that Mr. *Garengeot*'s Diſtinction of a Dropſy into that by *Epanchement* (Effuſion) and *Infiltration* is not juſt, and that the latter is not a Word in any Language. Mr. *Garengeot* anſwers this, (*p.* 403.) with a "*Voila une remarque*

"*de*

" *de Mr.* Friend *qui ſent bien un homme* " *peu inſtruit de la langue Françoiſe.*" If I ſhould be told that my Aſſertion ſmells as ſtrong as any Expreſſion of Dr. *Friend*'s of a Man who is ignorant of the *French* Language, I muſt ſay that Dr. *Friend* was not in ſuch a great Miſtake, notwithſtanding the Uſe and Cuſtom of all the *Garçons* and *Compagnons* of the *Hotel Dieu.*

I affirm this with great Confidence, becauſe Mr. *Garengeot* is of my Side; for in copying Dr. *Friend*, without acknowledging him, he has explained both Sorts of Dropſy depending on the ſame Cauſe, and produced in the ſame Way, only the Cavity of the *Abdomen* is the Place where the *Seroſité* is poured out in the one Caſe; and (*p.* 398) " it is *Epanchè & Infiltrè* into the " fatty Cellules in the other." Whether then is not a Diſtinction of Names unneceſſary, by which neither the Manner of a Diſeaſe forming, the Cauſes on which it depends, nor the Seat of it are diſtinguiſhed? And therefore is it not right to ſay, that if *Infiltration* is a Word at all, it is not juſtly applied here, and conveys no Idea? It is Mr. *Garengeot*'s Buſineſs to ſhow that *Infiltration* is *French*; I know *filtrer*, *filtration* are *French*, as *filtre*, *filtrate* are

English; but I am not so well persuaded of *Infiltrate* being used by any standard Author of either Language.

The Objections unworthy of a School-boy were made by Dr. *Friend* to an Account of the *Syncope* after tapping, formerly asserted by *Galen* (*a*), and repeated by *Aquapendente* (*b*), and now as fondly embraced by Mr. *Garengeot*, as if it was the genuine Production of his own profound Meditations. I shall not take on me to determine how far either the *Doctor* or Mr. *Garengeot* is in the Right or Wrong; but I think it is evident Mr. *Garengeot* has not refuted Dr. *Friend*'s Opinion, nor sufficiently proved his own. To show the Falsity of Dr. *Friend*'s Account of the *Syncope*, it was necessary to have brought good Proof of no Effusion of new Serosities into the *Abdomen* happening after the *Paracenthesis*, which our Author does not attempt. And he has taken very effectual Care to disprove his own Opinion of that Symptom depending upon the Diaphragm being pulled down by the Weight of the Liver; for he has expressly ordered the Patient to be put in a lying Posture, and has bestowed two Plates to show him in that Attitude, when

(*a*) Comment. in Hippocrat. Aphorism. § 6. Aph. 27.
(*b*) De Chirurg. operat.

when the Tapping is performed. If Mr. *Garengeot* had vouchſafed to conſider, that when one lies horizontally on his Back, the *Hypochondria* are the moſt depending Parts of the *Abdomen*; and when we lie on either Side the hypochondriac Region of that Side is loweſt; he would readily have diſcovered, that ſince according to him, the Liver and other *Viſcera* are not determined by any other Power to any particular Situation, but are left after *tapping* to act by their own Gravity only, they would have no ſuch Effect as he alledges, when the Patient lies either on his Back or Right-Side; and if he ly on the Left-Side, the Liver wou'd only pull the Right-ſide of the Diaphragm, where the *Pericardium* is not fixt to it. Thus it is to be a moſt ſubtle Anatomiſt; ſuch groſs Things muſt eſcape one who is judiciouſly employed in counting every little Production and doubling of a Cobweb (*a*), while others of a much lower Rank than Dr. *Friend*, muſt be content to take up with Obſervations *qui ſautent aux yeux*, that obviouſly ſtrike the Eye.

But further, it ought to be remarked, how much our Author ſeems to differ for

(*a*) See Deſcription of the Peritoneum in the Splanchnologie.

once from the principal, I had almoſt ſaid the only Perſon he has any extraordinary Regard for, who in *p.* 392. of this ſame firſt Volume, accounting for hydropic People being like to ſuffocate when they lye, ſays, " *Les malades etant couchès* " *les eaux qui ſont dans le ventre font au-* " *tant d'Effort en haut qu'en bas, cé qui* " *pouſſe conſiderablement lé Diaphragme* " *dans la Poitrine.*" If the Waters can, as he ſays, make as great an Effort upwards as downwards in this lying Poſture, is not the Diaphragm as low as the Navel, and hypogaſtric Region? and ſince all Bodies acting by their Gravity naturally tend to the depending Part, ſhould not the Liver, *&c.* puſh the Diaphragm conſiderably into the *Thorax*, as well as the Waters do? The contrary of which Mr. *Garengeot* has aſſerted to be true, tho' he had (*p.* 154.) brought an Obſervation of Mr. *Winſlow* that proves the Deſcent of the Liver in an erect Poſture, and conſequently its Aſcent in a horizontal Situation.

Among a great many Paſſages where our Author with equal Juſtice refers to his *Splanchnology*, there is one on the Subject of this Diſpute which appears ſingularly curious, (*p.* 427). His principal Argument for proving the Liver's Weight capable of diſturbing

ſturbing the Action of the Heart is founded on the conoid Figure of the Pericardium, which, ſays he, *j'ai fait ainſi graver le premier dans ma Spanchnologie.* That he ſhould be the firſt who cauſed the Pericard to be ingraved of a conoid Figure is a ſurpriſing Diſcovery; pray Gentlemen, What is the Figure of it as it is repreſented in *Veſalius*, *Euſtachius*, *Bauhinus*, *Bidloo*, *Cheſelden*, *Heiſter*? I can ſcarce admit an Apology offered here in behalf of our Author by ſome of my fellow Prentices, *viz.* That the Text of theſe Books being *Latin* or *Engliſh*, they are not to be ſuppoſed of Mr. *Garengeot*'s Acquaintance; for theſe Gentlemen have certainly forgot that the Language of Pictures is univerſal.

Mr. *Garengeot* gives another ſtrong Hint, in a Line or two after, of ſuch another Diſcovery; for ſays he, "If the Heart is ſituated tranſverſely in that membranous "Baſe, as I have demonſtrated beyond all "Doubt." Truly I believe the tranſverſe Poſition of the humane Heart has not of a long Time been called in Queſtion.

A propos of our Author's *Splanchnology* to which we are ſo often referred, *Voila* another Manner of making References to it, which our Author might for ſome certain Reaſons have expected would ſome time

time or other be pointed at, and that is, to turn up in the *Splanchnology* the Deſcriptions of ſuch Parts as are ſaid to have been demonſtrated publickly many Years ago, or before 1727 or 1728, by an Author who is above all Exception as to his *Veracity* and *priſca fides*, I mean Mr. *Winſlow*, in the 4th and 5th Volumes of his *Expoſition Anatomique de la ſtructure du Corps humain*, where the Deſcriptions are alike let a *Nota* be put on the *Splanchnology*, and then number the remaining Diſcoveries in it, you'll certainly after that admire ſeveral remarkable Qualifications of Mr. *Garengeot*. Leſt you ſhould think me to have miſtaken Mr. *Winſlow*'s Deſign, allow me to refer to one of the beſt Judges in anatomical Matters, who has been at ſome Pains to explain the private Hiſtory of the *Splanchnology*, *viz. Heiſter Edit.* 4. *Compend. Anat. Monita in Splanchnolog. Garengeot.*

Another Paſſage in Dr. *Friend*'s Book, where our Author ſeems to think the Doctor's ill Humour at his Confinement may have tempted him to do Mr. *Garengeot* Injuſtice, is in the Preface to the 1ſt Volume: "The Sheets which treat of an inguinal "*Hernia* were printed off, ſays the Do- "ctor, before I had ſeen the Tranſlation "of Mr. *Garengeot*'s Surgery, who is the

"only

" only Writer I know of that has taken " Notice of a crural Rupture; however " the Subſtance of what is here ſaid on that " Subject was explained in a publick Au- " ditory fourteen Years ago." What Cauſe of Offence ſhould be contained in theſe Words I was at a Loſs for ſome time to diſcover, but after being better acquainted with the Genius of my Author, I found an unpardonable Fault in Dr. *Friend*, to allow his Book to be printed before he knew of Mr. *Garengeot*'s, or to pretend to have any Notion of this Diſeaſe without being taught it by this Gentleman; at leaſt, the Doctor ſhould not only have given him the Honour of being the firſt who wrote on the Subject, but ought to have acknowledged *qu'il a eté bien au dela* (*p.* 261.), which I would interprete, That he was as far from the Honour of the Diſcovery as he would perſwade us the Subſtance of what he ſaid was beyond what the Doctor has wrote on this Subject.

Mr. *Garengeot*'s hiſtorical Account of the Diſcovery of a crural Rupture is certainly a moſt exquiſite Maſterpiece of Learning and Criticiſm; he ſays (*p.* 240.) " If " the crural *Herniæ* are not found deſcri- " bed in Books except in two Antients;" and in the next Paragraph he quotes theſe

two

two Antients, *Paul* and *Barbette*: Would not one think by our Author's coupling theſe two together as Antients, that he leaves us at ſome Loſs to know whether by *Paul* he means the Apoſtle, or one of the *Principes Artis Medicæ*, or if both Paſſages are from *Paul Barbette*. The Difficulty there is in purchaſing any of the three in *French* at *Paris* increaſes the Suſpicion. But to ſhow you how favourably I would wiſh to explain Mr. *Garengeot*'s Words, I ſhall allow him to have learned from the *French* Tranſlation of Dr. *Friend*'s Hiſtory that there was ſuch a Man as *Paul* of *Ægina*, and then you know there is nothing in a *Maitre és Arts* bringing under the ſame Claſs one Perſon who lived in the End of the laſt Century, and another who flouriſhed a Trifle of ten Centuries or a thouſand Years before. Let us therefore ſuppoſe our ſelves extricated from this trifling Piece of Chronology; there is I muſt own ſome Difficulty to reconcile what our Author writes in general of theſe two Antients and his Account of *Paul*'s Words; for firſt, according to him, "The two "Antients ſay very little, and expreſs "themſelves very confuſedly:" And afterwards he introduces "*Paul* an antient "chirurgical Operator ſaying, That the "Gut

" Gut may be puſhed into a Cavity of the " Thigh betwixt the *Pectinæus* and *Sar-* " *torius* Muſcles where the crural Veſſels " deſcend." This is not ſaying much indeed, but it is plaguily plain, and therefore our learned Author, to ſhow this to be an incomplete and confuſed Deſcription, ſubjoins, (*p.* 241.) " *Paul*'s Remark is " true, but the Diſeaſe is not at ſuch a " Height except in antient crural *Herniæ*." No leſs ſure than a Maſter of Arts could have contrived ſuch a maſterly Solution of this Difficulty.

Though at firſt View this Argument may ſeem to be exhauſted, yet I imagine this profound Anſwer of our Author would not be worſe for ſome Aſſiſtance, which with all the humble Deference that even Mr. *Garengeot* can expect I ſhall endeavour to give it. In the *firſt* Place then, being ſupported by the true Spirit of a Critic, I ſuſpect ſome Interpolation in the Text from which our illuſtrious Author has copied this Paſſage of *Paul*, for *Pectinèe* and *Conturier*, (*Sartorius*) or Words of the ſame Meaning in any Language, were not uſed as Names of Muſcles till long after *Paulus Ægineta*. *2dly*, The whole Paſſage is ſpurious, *Paul* not giving the leaſt Hint of his knowing any thing of this Diſeaſe. *3dly*,

The

The plain Reaſon of this hiſtorical Eſſay being ſo embaraſſed is, That Mr. *Friend*, among his other *Vetilles*, took the Whim to write an Account of crural *Herniæ* when he was treating of *Paul* of *Ægina*, and that for no other Reaſon forſooth, but becauſe this ſame *Paul* ſeemed to know more of the other *Herniæ* than his Neighbours, and the ſaid Mr. *Friend* ſtuffed this Account with Words of his own, and three or four more Barbarians, whoſe Names, if all put together, would not exceed *René Jacques Croiſſant de Garengeot* without the Titles; and therefore the whole Story could not be underſtood otherwiſe by our Author than as a Copy of the Man's Words whoſe Name was prefixed to this Part of the Diſcourſe. 'Tis true there is a Paſſage in our Author which ſeems to imply ſome Contradiction to this Apology of mine, for (*p.* 248.) he ſays, "Mr. *Friend* pretends "that there is only the Inteſtine which "forms the Bubono*celle*." I ſuppoſe he gathers this from theſe Words of the Doctor's Hiſtory (*p.* 166.) "*Paulus* ſays, "that a Bubonocele always preceeds an "Enterocele." But this is only done by Mr. *Garengeot* with a Deſign to ballance Accounts, for in the former remarkable Paſſage he had borrowed from *Friend* to

give

give to *Paulus*, and in this he compliments the Doctor with a Paſſage of the *Grecian*, which you muſt acknowledge to be a notable Inſtance of *ſummum jus*.

You ſee how handſomely Mr. *Garengeot* has acquitted himſelf in the Diſpute with Dr. *Friend*: But theſe Proofs of his Skill in Argument and Criticiſm ſcarce deſerve to be compared with the many notable Diſcoveries in *Languages*, *Phyſicks*, *Botany*, *Chemy*, *Pharmacy*, *Anatomy*, *Animal Oeconomy*, *Surgery*, *Medicine*, *&c. &c.* to be met with every where in his Books; it is a Pity ſome able Hand does not undertake to ſet them in a due Light, I neither dare preſume to be equal to ſuch a Task, nor can expect you would allow ſuch a Work a Place in your Collection, but beg for once to be indulged, while among ſuch a great Variety as almoſt makes one at a Loſs to know what to chuſe, I point out one Example or two of each ſort of Learning that occurs in the ſame Volume in which *Les Vetilles du Mr. Friend ſont relevées*.

[*We muſt here ſtop this young Man's Carreer; he is done with the Defence of Dr.* Friend, *which was the only Motive we had to allow any Part of his Paper to appear; but among the great Heap of ill-natured*

tured Remarks that we ſuppreſs, there are two or three Obſervations which may be of ſome Uſe; and for this Reaſon we ſhall take the Freedom to ſtrip them of their jocular Air, and communicate them in a plain Dreſs.]

The Rule of beginning to ſtitch a tranſverſe Wound of a Muſcle or Tendon on the Side where the greateſt Contraction of the Muſcle is to be expected is, according to our Correſpondent, unneceſſary, if not hurtful, becauſe the paſſing of the Needle and Thread through that Lip of the Wound irritates the Muſcle to contract, and conſequently in the Time that the other Lip is in piercing, the firſt one will be retracted conſiderably from it, and thence there will be a greater Difficulty in bringing them together, whereas if the more contractile Side was laſt of being pierced, the two might be brought together and the Threads tied without their being allowed to ſeparate far.

He is of Opinion that a ſmall Compreſs of Linnen, or a Piece of rolled Taffetas put betwixt the Knots, by which the Threads are ſecured in an interrupted Suture do no Service, and on the contrary gall the Parts on which they reſt.

He

He concludes his Paper with these Words: By bringing one Example of each Author quoted by Mr. *Garengeot*, you will not now doubt how far his Knowledge and Candour are to be depended on, but I have been thereby tempted to make my Paper longer than I designed; all I can say for my self is, that this Article of his Learning deserved most to be considered, because better Judges than I seem to have thought it his *Fort*, when they assigned him the Office of making Extracts of Books, which Extracts are to be published under the Name of no less than an Academy. After his Talents in this Way are set in their proper Light, these Gentlemen may possibly find it necessary to make a nicer Scrutiny into this and the other Branches of that great Work, wherein the Chirurgical Academy lately instituted, and otherwise so well calculated for the Improvement of Surgery, is engaged; in which I wish them all imaginable Success, and hope they will think good Manners and Accuracy no unnecessary Qualifications to recommend their Labours to the World.

XXV. *An ESSAY on the Improvement of* Medicine, *by Dr.* JOHN DRUMMOND *senior, late President of the Royal College of Physicians in* Edinburgh.

BY accurate Observations and just Reasoning upon these it is that Physick can be brought to any Degree of Perfection; one of these is by no means sufficient for the Purpose; the greatest Masters of Reasoning have often proved the most unsuccessful Interpreters of Nature, by neglecting to consult Nature itself, and overlooking the most obvious *Phænomena*: *Aristotle*, with all the Advantages of a great Genius, and most uncommon Opportunities of improving Philosophy and Physick, made no better Use of these, than from some abstract Notions of Matter and certain fictitious Elements and Qualities to account for the Appearances in Nature; and fancying some chimerical Analogy between the *Macrocosm* and *Microcosm*, between the political and animal Oeconomy, endeavoured to make all Things chime to this whimsical Hypothesis. Physicians soon

ſoon adopted *Ariſtotle*'s Notions, and reaſoned from the ſame Principles; for many Ages nothing was to be heard in the Schools but Wrangling and Diſputes about Words, uſeleſs Diviſions and Diſtinctions of Qualities and Forms, and various Gloſſes and Interpretations of *Ariſtotle*'s and *Galen*'s Writings: Not one dreamed of ſearching out the Truth, of confirming or diſproving any doubtful Opinion by Experiments and careful Obſervations of Facts, but relied intirely on the Authority of their Maſters; the Study of the Inſtitutions then in Vogue either confirmed ſo many Wrong-heads, or made others meer Empiricks, not finding any Certainty in the Doctrines of the Schools to eſtabliſh a reaſonable Practice upon.

The *Chemiſts* indeed threw off the Yoke of the School Philoſophy, and pretended to eſtabliſh a new Theory upon Experiments, but theſe were few and very much wreſted and miſapplied; their Fondneſs for ſome Diſcoveries made by the Help of Fire led them to quite neglect all other uſeful Enquiries into the Structure of the humane Body, the Nature and Properties of the Liquors contained in it, and the Laws by which they moved, and hurried them on to an Extravagance beyond Example, ima-

gining ſuch Principles of Action and ſuch violent Motions as are altogether inconſiſtent with the Life of an Animal.

When the Study of the *Mathematicks* was revived in *Europe*, then indeed might have been expected a thorough Reformation of Phyſick, and greater Certainty than had hitherto obtained; *Des Cartes* ſoon attempted to apply mechanical Reaſoning to the animal Oeconomy; but tho' he had a profound Knowledge of the Mathematicks, for thoſe Times, yet wanting a perfect Skill in Anatomy, and a ſufficient Number of certain Obſervations, he framed Hypotheſes to himſelf which were productive of many Blunders.

Many notable Mathematicians after him have ſucceeded no better in their Attempts, merely for want of ſufficient Care to aſcertain the *Data* on which their Reaſoning is built; and too frequently it has happened that thoſe who are Maſters enough of the Mathematicks have not had Time, Opportunities or Genius for nicely obſerving the Facts on which they were to reaſon, and others of a quick Imagination have argued themſelves into a Belief of Facts contrived in their own Brains being real and true, becauſe forſooth ſo much fine Reaſoning could never follow from a Falſhood; ſo

that

that however absurd we may think *Aristotle*'s monarchical despotick Government of the Heart, or *Des Cartes*'s Flashes of Fire contained in the *Parenchyma* of that Bowel, there are not wanting of their Successors who have not been much more modest in their *Postulata*.

On the other hand, many of the Gentlemen who have employed themselves in making Observations of Facts were utterly incapable of putting them to the right Use, nor have they taken care to represent them in such a Way as to be useful to others.

Your Design, Gentlemen, has the Appearance of removing the Difficulties that thus retard the Improvement of Physick, and I hope will introduce Reason and Experience united in perfecting this Art, with a View to promote which I take the Liberty to submit some Things to your Consideration, which I have observed either very much to obscure and confound our Conceptions about the genuine Nature of Distempers, or to seduce the unwary Beginner from the rational Method of practising, and to offer to your Censure some Hints for redressing these Mistakes.

The Complaint which *Galen* makes of the Physicians in his Time distinguishing too nicely the Species of some Diseases, ra-

ther for pompous Names than for any Advantage to Medicine, is much more justly to be made now, when it has been the Misfortune of this Art to be loaded with such Numbers of Names to each Disease, and such minute and subtile Distinctions of them, by which a Beginner on viewing a Catalogue of Distempers in some of the systematick Writers, will be apt to imagine that each Name denotes a Disease very different from any other, and that he must learn a particular Method of Cure adapted to each; whereas if the Matter was duly considered, it would appear that these numerous Lists might be much abridged, by reducing many Diseases to the same Class or general Head. It is indeed scarce possible to find two Cases in any Disease strictly parallel in every Circumstance; but it would be ridiculous from every accidental Circumstance in a Case to distinguish it with a new Name, when the principal Symptoms which deserve most our Attention are the same in innumerable Cases, and show that they have the same common Cause, the same general Indications, and therefore ought to be reduced to the same Class. Undoubtedly it would be of great Use to Students of Medicine, or young Practitioners, to accustom themselves to form simple and distinct

diſtinct Ideas of Diſeaſes, and in their firſt Conſideration of them, to ſet aſide all the ſmaller Differences and accidental Circumſtances, and to ſearch out that which is of moſt Conſequence in any Diſeaſe, and wherein it agrees with moſt others. Some Examples will perhaps ſerve to illuſtrate what I mean.

Authors diſtinguiſh an *Hæmoptoe* into a great many Species, ſuch as *Anaſtomoſis*, *Diaireſis*, *Diapedeſis*, *Rixis* and *Diacribroſis*, and write a great deal of the different Cauſes of theſe *Hæmoptoes*, and of the Signs by which they are to be diſtinguiſhed, which however are of very little Importance; on the contrary, it would be more for the Advantage of a Beginner, to conſider a *Hæmoptoe* ſimply as a preternatural Flux of Blood, and as ſuch it agrees with the *Hæmorrhagia narium*, *Vomitus ſanguineus*, *Diarrhœa cruenta*, *Hæmorrhoides*, *Mictus cruentus*, *Profluvium nimium menſium*, &c. all which have the ſame immediate Cauſes, the ſame Effects and Conſequences, and ſuggeſt the ſame Indications of Cure, *viz.* In the Beginning the Quantity of Blood muſt be diminiſhed, and a Revulſion made by opening a Vein in the Arm, Foot, &c. the Velocity and Rarefaction of the Blood muſt be modera-

ted by cooling Medicines: And laſtly, the Dilatation or Rupture of the Veſſel muſt be contracted and ſtrengthned by Aſtringents. It is true that the Situation and Function of ſome Parts from which the Blood flows make the Diſeaſe more dangerous, the Application of Remedies more difficult, and their Effects leſs certain in ſome *Hæmorrhagies* than in others; yet the ſame Method muſt take Place in all, and therefore the general Title of this Claſs of Diſeaſes ought to be *Hæmorrhagia*; and it would be as needleſs to treat of each of them as a diſtinct Diſeaſe, as it would be to diſtinguiſh the *Rheumatiſm* into as great a Variety, becauſe it ſeizes on the Neck, Arm, Hand, Leg, Foot, *&c.*

Fevers have been treated of in large and numerous Volumes, and have been diſtinguiſhed into many Species; *Riverius* reckons above thirty different kinds of this Diſeaſe, and *Sydenham* has encreaſed them to double that Number; but certainly theſe Authors and all other Phyſicians have obſerved ſomething common to all theſe Diſeaſes which made them denominate them Fevers. The Conſideration therefore of this which conſtitutes a Fever (which upon Examination will be found very ſimple and obvious) with its true Cauſes and genuine

nuine Effects, will give one a more juſt and clear Notion of the Diſeaſe, and lead him to a more rational Practice, than all that has been ſaid at ſo great Length on theſe ſubtile and unneceſſary Diſtinctions, which one would be almoſt tempted to believe had only been made by obſerving the ſame Diſeaſe in different Perſons: And in this View alſo it will appear that the moſt natural and uſeful Diviſion of Fevers is into continued and interrupted, for I humbly conceive they may all when conſidered ſimply, and not as the Effect of another Diſeaſe, be reduced to one or other of theſe two Sorts.

Ophthalmia, *Angina*, *Phrenitis*, *Peripneumonia*, *Pleuritis*, *Hepatitis*, *Nephritis*, *Rheumatiſmus*, *&c.* have all the ſame Characteriſtick, and differ in nothing but the Part affected; ſo that if one has a right Knowledge of an Inflammation on an external Part, its Progreſs and proper Remedies, and at the ſame time is throughly acquainted with Anatomy and the animal Oeconomy, he cannot be at a Loſs to diſtinguiſh and treat any of the Diſeaſes belonging to this Claſs.

Carus, *Cataphora* or *Subeta Avicennæ*, *Lethargy*, *Coma vigil* or *Typhomania Galeni*, *Palſy*, *Paraplegia*, *Hemiplegia*, *&c.*

&c. are nothing but different Species of the *Apoplexy* in a lesser Degree.

Anasarca, *Leucophlegmatia*, *Hydrops Ascites*, *Tympanites*, *Hydrocele*, &c. differ so exceedingly little, they scarce deserve the retaining so many pompous *Greek* Names.

Some Authors have distinguished Diseases from their Causes, tho' these do not, in the Suppositions they make, alter the Symptoms or Method of Cure; as for Instance, *Morton* reckons among the Species of *Phthisis* those proceeding from *Diarrhæa*, *Dysentery*, *Gonorrhæa*, *Hæmorrhagy*, *Dropsy*; and from forty other Diseases, and perhaps there are thousands of remote Causes more which can produce a Consumption, without varying the common immediate Cause of the Disease, or the Method of Cure, and therefore needless to be enumerated.

These few Examples may serve to explain what I intend, by proposing to reduce Diseases to a few general Heads, and may possibly give the Hint to some abler Pen to undertake a thorow Reformation of useless Names, to which if they please to tack Receipts of extravagant Length, where it is scarce possible to determine to what Purpose most of the Ingredients serve,

except

except to increaſe the Bulk of the Compoſition, I am perſuaded they wou'd very effectually promote the Art of Healing.

Tho' I wou'd argue for the uſefulneſs of abridging the numerous Names of Diſeaſes, and of reducing the unreaſonable *Farrago* of Medicines in Preſcriptions, yet I would earneſtly exhort all Phyſicians to beware of falling into the oppoſite Fault of preſcribing, when they have only learned the general Name of the Diſeaſe, without having exactly and carefully examined all the Circumſtances both of the Patients, and of their Diſeaſes; for I am convinced there is ſo little Hope of obtaining any univerſal Medicine to cure all Diſeaſes, that there is not any Medicine proper for any one Diſeaſe in all Stages of it, and to all Patients, except perhaps in preventing the Effects of ſome Poyſons, of which we know no more than that ſome particular Antidotes have done Service; ſuch is the Salt, or rather the *Axunge* of the Viper, to the Bite of that Animal; and therefore your Caution, Gentlemen, in the Article of your Scheme concerning the Hiſtories of morbid Caſes, is certainly juſt and neceſſary; for without the Patient's Age, Sex, Conſtitution, *&c.* and the Symptoms and Circumſtances of a Diſeaſe are related, the Obſervation is of little

or

or no Uſe, ſince practiſing by Rote has no fairer Chance for curing, than a blind Man has to ſtrike a Dog, who ſtands barking at a Diſtance: And this it is that principally muſt diſtinguiſh between a rational Phyſician and a pretending Empirick. As a Proof of this, I ſhall curſorly mention Examples of ſome of the moſt common Diſeaſes, where a particular Form of Practice generally prevails, and ſhall chuſe out ſuch as ſerve to illuſtrate the ſeveral neceſſary Circumſtances taken Notice of in the Article of morbid Caſes above-mentioned.

Suppoſe two Perſons ſeized with an *Apoplexy*, one is a full bodied vigorous young Man after a Debauch, the other is an old feeble Perſon, long ſubject to *Catarrhes*, I preſume blooding very plentifully muſt be the principal Thing depended on for the Cure of the firſt, and that this Method would very effectually deſtroy the other, who muſt be treated with every thing that ſtimulates.

A rigid old Man, and a healthy young Boy, are both ſeized with an Inflammation tending to a Gangrene in their Extremities; Evacuations and topical emollient Applications are proper for the Boy, Cordials and topical Antiſepticks for the Man.

A Man and a Woman of middle Age, healthy

healthy and vigorous, are, without any previous remarkable Symptom, taken with a ſmall *Hæmoptoe*; the Man is let Blood of plentifully, is kept cool with a low Dyet, and has Aſtringents given him; the Woman being near the Time of her *Menſtrua*, is to have this natural Evacuation forwarded, which proves her Cure.

Two Perſons of the ſame Sex and equal Age, but one brought low by a Diſeaſe, the other Plethorick, catch an Ague at the ſame Time. The Plethorick Perſon requires to be blooded, and by other Evacuations to have his Veſſels emptied; the other muſt be ſupported by a nouriſhing Dyet and cardiac Medicines.

Two Men of equal Age and Strength, one of whom has lived temperately and ſoberly, the other has every Day drunk two or three Bottles of Wine at leaſt, are both ſeized with a Fever; the firſt is kept ſucceſsfully at cooling Emulſions, the other muſt have an Allowance of Wine; for uſe them in the reverſe Way, the temperate Man will have his Fever unſufferably raiſed, the other will become quite diſpirited.

A Child has complained of Pains in his Belly, ſhricks frequently, grinds his Teeth in his Sleep, and has formerly paſſed Worms by Stool; a Man has been ſeized

ſome

ſome Hours with a Fever. Both fall into Epileptick Fits, which are to be cured in each by removing their Cauſes, and therefore require very different Treatment.

Two Perſons brought low, one with a Fever, the other with a Palſy of ſhort ſtanding, take each a quotidian or tertian Ague; the firſt is to have his Ague ſoon ſtopped; the other is to bear the Ague as long as poſſible.

One Man has been nigh exhauſted with loſs of Blood, another has lived too fully for ſome Time; both, after Exerciſe complain of a great *Anxietas* and Difficulty of Breathing, with a Faintneſs, Inability in their Limbs, and trembling all over their Body; their Pulſes do not beat ſtrong, and all the perceptible Difference is, that the Arteries of the latter feel hard and firm like a Cord, while the former's Pulſe is ſoft, and makes no Reſiſtance; tho' the Appearances in both are the ſame, yet this laſt Circumſtance, and the preceeding Hiſtory determine the Diſeaſes to be exactly oppoſite; the one is from the Emptyneſs of the Veſſels; the other from a *Plethora*; and the Method of treating them are directly the Reverſe of each other.

No Rule is more general than that of Blooding in *Pleuriſies*; but ſuppoſe a Phyſician

ſician called in the fifth or ſixth Day of the Diſeaſe, and ſees the Patient coughing up *Pus*, Blood-letting is ſo far from being requiſite, that it is hurtful.

The common Practice in the Beginning of the *Small-Pox* or *Meaſles* is to let Blood; but if the *Exanthemata* are pale, the Patient's Pulſe low and ſlow, without any Oppreſſion at his Breaſt, Cardiacs are of Service, and Evacuation by Venæſection dangerous.

Authors ſeldom miſs to diſcharge drawing of Blood in a Dropſy, yet ſuppoſe a ſtrong Man after over-heating himſelf and drinking great Draughts of cold Drink, to have his Belly ſuddenly diſtended with Water; and upon this to have a great Difficulty of Breathing, and all his Veins very turgid, he muſt be blooded, otherwiſe his Diſeaſe will encreaſe, and the Circulation of the Blood in the Lungs will at laſt be entirely ſtopped.

To cure the Jaundice ſafely in a plethorick Perſon, eſpecially if attended with an Inflammation of the Liver, it is neceſſary to begin with taking Blood, contrary to the general Rule in this Diſeaſe.

In the ſame Manner, violent hyſterick Symptoms, occaſioned by the overfulneſs of the Veſſels preventing the *Menſes* to

flow

flow, are only to be removed, and the *Menſes* to be brought on by Blood-letting, notwithſtanding the general Maxim of making no Evacuation of Blood at this critical Time.

I am afraid to be tedious, otherwiſe I could multiply Examples of the ſame Kind. In ſhort name any Diſeaſe, and what Medicine you pleaſe as univerſally uſeful in it, and I can promiſe to ſhow Circumſtances of Patients, or of the Diſeaſe, where that Medicine would be very improper: Therefore let me intreat you to inculcate ſtrongly to your Correſpondents, to conſider well the Caſes of their Patients, to leave the Way of practiſing only in a *Routine* or by Rote to thoſe who ſcarce deſerve the Name of Empiricks, and to lay the Foundation of their preſcribing on Experience and Reaſon united; for of theſe it may be ſaid as *Horace* did of Art and Nature in Poetry,

Alterius ſic
Altera poſcit opem res & conjurat amicè.

XXVI. *An*

XXVI. *An Ulcer in the Lungs, piercing thro' the* Diaphragm *into the Liver; by Dr.* EDWARD BARRY *Physician at* Cork *in* Ireland.

AT the Desire of Mr. *Moore* Surgeon to Colonel *Groves*'s Regiment, I visited one of his Men, who ten Weeks before had been seized with a *Peripneumony*, attended with a Pain in the lower Part of his Right-Side, that never was acute, but terminated in an Abscess, and soon after broke. The *Pus* which he expectorated when I saw him was very fetid; and by lying on the opposite Side was discharged in a greater Quantity. His Body was much emaciated by frequent colliquative Dejections, attended with a perpetual *Nausea*. As he thus appeared to be in the last Stage of the Distemper, it was in vain to propose any Method of Cure.

About a Fortnight afterwards I was present at opening his Body, with several other Physicians and Surgeons.

We found a strong Adhesion of his Lungs to the *Pleura*, where he had a frequent

Pain, and to the *Diaphragm*. Examining into the purulent Cavity which lay immediately under the Surface of that adhering Part, we found it continued thro' the Diaphragm about an Inch deep into the gibbous Part of the *Liver*, which cloſely adhered to the Diaphragm. The Length of this *Sinus* was about ſix Inches, and its Diameter in the *Liver* was about three, but more narrow in the Lungs. The reſt of the Lobe of the Lungs was entirely ound.

XXVII. *A Tumor in the* Oeſophagus *from a ſingular Cauſe; by Dr.* GILBERT WAUCH *Phyſician at* Kirkleathem *in* Yorkſhire.

A Farmer named —— *Hart*, in the Village *Micklebec*, had a Daughter violently afflicted with Fits; which from their ſurpriſing Nature were judged by the Neighbours to be the Conſequence of Witchcraft; ſo that her Parents were a long Time in Suſpence whether they ſhould call to her Aſſiſtance a Clergyman or Phyſician; but at laſt they agreed to call me.

This Girl about Seventeen Years old, tho' lean, appeared to be in good Health, and

and went about the Family Concerns chearfully. Upon asking the Relations at what Time these wonderful Fits, of which I received so terrible a Description, would seize her. The Mother brought the Girl a Draught of fair Water, which she attempting to drink, was seized with violent Convulsions, and at last fell to the Ground as dead. In about half a Quarter of an Hour she began to speak, complaining of an intolerable Pain in her Breast, and a Weight upon her Spirits, or Anxiety which she could not express, and with her Finger pointed the Part affected, which was under the upper Part of the *Sternum*, where it is joined with the *Clavicles*. I could discover no Signs of Inflammation or Tumor there; but she insisted there was Cause of Complaint, tho' it lay out of my Sight, and assured me that for the two last Months she had taken no Food, even the most slippery, without suffering Fits of the same Nature with what I had seen, but that of late they had grown worse. Enquiring what Health she had enjoyed before these two last Months, I was told she was then afflicted with a violent *Quinsy*, accompanied with a high Fever; and when they expected that every Minute she would be suffocated, the Swelling about her Throat

ſuddenly diſappearing, ſhe was relieved in a great Meaſure; but was ſenſible of a painful Weight (as ſhe expreſſed it) remaining in her Breaſt, at the Place ſhe had pointed before, and from that Time Deglution had met with ſome Obſtacle, which had daily grown worſe. To this Relation of the young Woman, the Parents aſſented.

I concluded this Obſtacle to be from a Tumor, the Conſequence of the ſudden Tranſlation of the inflammatory Matter from the *Fauces*, to the Coats of the *Oeſophagus*. I was alſo ſenſible of the Difficulty of attempting any Thing to Purpoſe, till Nature ſhould point out the Way: But as this Concluſion would not be ſatisfactory to the Relations, and I might appear negligent of my Patient, I order'd a mild vulnerary Decoction for Drink, and an emollient Fomentation for the Breaſt. In ſhort in leſs than three Days the Tumor breaks, and the poor Girl was almoſt ſuffocated with the Stench and Quantity of the purulent Matter. Her Parents very reaſonably gave her a good Quantity of warm Water to drink; ſo by ſtraining to vomit, all the *Pus* was ſqueezed out of its *Cyſtis*; and by vomiting her Stomach was relieved from what might have occaſioned a *Diarrhœa* or worſe, and ſhe is now quite well.

XXVIII. *Spaſms*

XXVIII. *Spasms in the* Oesophagus; *by Mr.* James Aird *Chirurgeon Apothecary in* Cumnock.

Robert Aird younger of *Crosflet* aged Eighteen, a strong well-made Youth, troubled frequently with an Itchy Scurff on his Skin; complained of Cholick Pains in the Beginning of the Year 1724, which grew violent early in the Spring. They were attended with the following Symptoms.

He was costive, and his Spittle tasted salt or bitter for two or three Days before the Attack. His Skin became free of the Itch, and smooth on the Approach of the Fit. A violent Drought arose, and an Inclination to yawn, but he could not yawn freely. A Pain and Swelling began in the umbilical Region, reaching upward to the Stomach and both Hypochondres. He had a violent Headach, and reaching to vomit, accompanied with strong Shivering all over his Body. He threw up at some times bilious Matter, and at others a saltish *Rheum*. At last a *Stupor* seized sometimes his Legs, sometimes his Arms, and sometimes both, during the Paroxysm. His Urine was clear

and copious while the Fit laſted, but turned turbid and red after it was over.

The firſt Appearance of the Declenſion of the Paroxyſm, was a Sweat trickling down his Face, with an Ability to yawn freely.

I was called to him in the ſecond of theſe violent Fits, in the Beginning of *March*, about Twelve at Night. It had begun betwixt three and four Afternoon, and was attended with all the above Symptoms. I immediately bled him plentifully, which gave preſent Eaſe; next Day he was vomited, and, with an Intermiſſion, purged once and again; which, with a regular Diet, probably kept him free from any Attack for ſome Weeks.

In the Month of *April*, he was ſeized with a dangerous Fever, with ſtarting of the Tendons, *&c.* which laſted fifteen Days, but went off by a plentiful Sweat, and he continued well till

Thurſday the 21. of *May*, when after being three Days coſtive, he was ſeized with another Fit of his Cholick Pains, more ſevere than any of the Preceeding. All the Symptoms formerly mentioned raged moſt violently, particularly the Vomiting, with ſhaking and ſhivering to ſuch a Degree, as three ſtrong Men could hardly keep him in his Chair. It laſted from three Afternoon till

till near Midnight, and then went off of its own Accord: but on the Paroxyſms declining, he was entirely deprived of the Power of Deglutition; ſo as he could not ſwallow the leaſt Bit of Meat, or one Drop of Drink. He had a ſharp Drought, and ſome faint Inclination to eat. He complained of a Pain at the Pit of his Stomach, and on the left Side of his Throat. Being abroad, I did not ſee him till next Day.

Friday's Afternoon I came, and found him feeble, yet able to walk about; and thirſty, but not able to get over the leaſt Drop of Liquor, which he attempted frequently, but with ſo much Pain, reaching to vomit, and threatning of being convulſed, that he was forced to give it over.

On *Saturday* the 23d, he continued in the ſame melancholy Way. A Phyſician who had been ſent for, arrived that Afternoon, and left Orders for a Clyſter, with the Emollients and lenitive Electuary, a tepid Bath of Milk and Water, and a *S. Q.* of the following Cataplaſm, to be applied to the Pit of his Stomach, Neck and Jaws.

℞ *Theriacæ Venetæ, Unc.* ii. *pulv. fol. menthæ, Drah.* iii. *pulv. ſem. Abſinthii, Drah* i. Sem. *Ol. macis per expreſſ. Drac.* ii. Sem. *ſpir. vini camphorat. Unc.* ii. *Vini clareti Q. S. ut f. cataplaſm. molle.*

and, if these Things restored his Deglutition, to perfect the Cure a Vomit, and a *S. Q.* of the following Infusion to be given *diebus alternis*, so as to procure three or four Stools extraordinary.

℞ *Pulv. rhei elect. Unc.* Sem. *fol. menthæ pug. j. sal. Absinth. Drah.* sem. *Spec. hieræ picræ Drach.* i. *Aq. cinnam. s. v. lib.* sem. *agitetur phiala sæpius per triduum, & f. colatura turbida*, drinking Whey, Water-gruel or Chicken-broth an Hour after it.

While I was gone to cause prepare the Medicines, a Lady in the Neighbourhood persuaded him to attempt swallowing down some delicate Gelly or Marmalad. He twice endeavoured to do it with great Resolution; but his Courage cost him so dear, thro' the Violence of Pain, horrible *Nausea*, Reaching and Convulsion of the Parts, that he gave up any further Trials. And no wonder, for he was not only sore spent, but by the violent Contractions of the abdominal Muscles, he had forced the Gut into the *Scrotum*. This was immediately reduced, and he was laid to Bed in a very hopeless Way.

Sunday the 24th, he continued in the same Way, without being able to get over the least Drop or Bit of any thing; neither in-

indeed did he much attempt it, tho' he had no hydrophobic Averſion; for he frequently waſhed his Mouth with Whey, but durſt not gargle his Throat, or endeavour to ſwallow any of it. At laſt when he was brought very low, about ſeven at Night, the Medicines arrived from a very diſtant Place. The Cataplaſm was immediately applied to his Jaws, and to the fore-part of his Neck and Stomach. In leſs than an Hour he could ſwallow a little Drink; and before ten at Night, he could take down both Victuals and Drink. He was nouriſhed with Whey and Chicken-broth, and paſſed the Night pretty eaſily; but his Spittle continued to be very bitter.

Munday the 25th, he complained of little, except the Taſte of his Spittle and Weakneſs; on Account of which I delayed giving him the Vomit, and the rather that he had a plentiful Stool, he having had no Paſſage by Stool or Urine from *Thurſday* that the Paroxyſm began.

Tueſday the 26th he got a Vomit of emetic Wine in the Morning, which brought up an immenſe Quantity of curdled bilious Stuff, by which he was greatly relieved: But obſerving him pain'd by the Spaſm in the left Side of his Throat, when he reached to vomit, I did not preſs him to continue

nue vomiting, but put him to Bed. He had ſome Stools, that and next Day.

Thurſday he began to uſe his purging Tincture, by which he evacuated great Quantities of bilious Stuff. He took it every ſecond Day, till he conſumed double the Quantity preſcribed; for he had it renewed, by pouring Canary on the *Reſiduum*, which purged him in the ſame Manner. The more he purged the more he found himſelf relieved; and the ſaltiſh and bitteriſh Taſte of his Mouth gradually went off. After he had purged ſome Days, he began (as he uſed to do pretty frequently in Health) to ſweat a little in the Night, tho' he had ſweated none all the Time of his Illneſs.

After his purging Tincture was ended, he uſed ſome corroborating Medicines, and was reſtored to perfect Health, and has been free from any Complaint of that Kind now theſe eight Years.

As to the *Hernia*, he wore a Truſs for ſome Time, but as he had never been troubled with it before that Fit, ſo he has been free from it ever ſince.

Mr. *Aird*'s getting ſo eaſily free of his Rupture, will appear the leſs ſtrange, when I tell you of a Gentlewoman my Patient, who by lifting a great Weight from a Table to the Ground, had in a Moment a

Her-

Hernia inguinalis, that gave her intolerable Pain, till it was reduced. She was ordered to ly constantly a Bed for ten or twelve Days, with a Woolen Cloth six or eight fold, wrung warm out of a strong Decoction of Oak-bark and *Allum*, with strong Red-wine, press'd close on the Part. All the Time she was free of Pain, and then rose in perfect Health, and has since born Children without a Relapse, or any uneasiness from the Rupture.

XXIX. *An Inflammation of the Stomach, with* Hydrophobia, *and other uncommon Symptoms; by Dr.* JOHN INNES, *Fellow of the College of Physicians, and Professor of Medicine in the University of* Edinburgh.

A Young Gentleman, well made, of a florid blooming Complexion, all his Life healthy and vigorous, was last Summer, on excessive Walking in dry hot Weather, suddenly seized with a sharp Pain at the upper Orifice of his Stomach, soon after attended with difficult Breathing; both which almost as suddenly disappeared on plentiful Blooding. Last Winter he had some faint Returns of the same, but by gentle

gentle Evacuations, keeping at home, and moderate Diet, he eaſily got the better of them.

He lived very temperate, much at Home, and in perfect Health till the End of *March*, when he could only obſerve his Appetite leſs, and Digeſtion ſlower than uſual.

April 2. 1732. He went to Bed in perfect Health, was awak~~ened~~ next Morning with a Pain much like the former, tho' neither ſo exquiſite nor equally ſharp, but that he could make a Shift to put off with it, and even at ſome Intervals ſleep a little, till ten next Morning; when all of a ſudden it became ſo violent, as to force him inſtantly to call out for his old Cure, a plentiful Blooding; on which, for ſome Minutes, he thought himſelf entirely relieved, but ſoon after complained of a ſtrange Anxiety; difficult Breathing, Coldneſs of his Extremities, and Convulſions of the *Diaphragm*.

I ſaw him before Eleven, when I found his Pulſe much oppreſſed, very irregular, and often intermitting, his Extremities chill'd, his Breathing almoſt ſuffocated, fetching heavy Sighs, and very often looking ghaſtly, ſpouting *Saliva* frequently, and roaring out ~~for~~ *from* a ſharp burning Pain gnawing his Stomach; and now his Pulſe

at the Arm was ſcarcely to be felt, but at the Temples was frequent and irregular.

After ſome Heſitation he was blooded plentifully, on which his Pulſe became fuller, equaller, and a new Heat was diffuſed over all his Body, the Pain remitted, and his Breathing became free.

Twenty Minutes after his Extremities became cold, his Pulſe feeble and irregular, his Breathing oppreſſed, and his Pain quicker than ever. He was immediately blooded, and ſeemed for five Minutes ſomewhat relieved; then all of a ſudden his Extremities became cold and rigid, as of a dead Body, his Pulſe at no Rate to be felt; immediately he cried out that every thing was turning round him with ſtrange Rapidity; ſoon after that he ſcarcely ſaw the Objects, but imagined himſelf in ſuch a Motion, at laſt ſaw nothing; and quite bereaved of all his Senſes, raved in the moſt extraordinary Manner, often ſtarting up and tearing every thing about him, ſpouting perpetually great Quantities of Water, ready every Moment to be choaked in his Breathing, making no Complaints of his former Pain, but crying out in the moſt pitiful Manner, how he was abandoned by all, and left among Flames that were conſuming him,

vowing eternal Revenge on all that had ſo uſed him.

The Tone of his Voice often changed, he had Convulſions frequent in his Face; at length, as if wearied out with this Shock, he fell calm, tho' ſtill pretty much inſenſible; at which Time by the concurring Advice of two other Phyſicians, Drs. *Robert Lowis* and *James Eccles*, he was plentifully blooded; on which he returned to the full Exerciſe of all his Senſes, (except that of ſeeing diſtinctly) and ſeemingly to good Health.

He had ſome Intervals during that extraordinary Shock, and called inſtantly for Drink; but the Moment he ſaw it, fell into the moſt ſurprizing Horrors, and as it approached him, ſtarted, looked frighted, had frequent Convulſions, eſpecially about his Mouth, and peeviſhly put it away with his Hand; and then with an Air that ſpoke at once Fright and Reſentment, he would ſtare after the Drink, and ſoon after impatiently call for it, and repeated the ſame Scene.

After this laſt Blooding finding himſelf more than ever before relieved, he called haſtily for a little warm Milk and Water, he greedily glutted in a Mouthful, and that very Moment with great Force ſpouted it at a great Diſtance, and after it an incredible

dible Quantity of *Saliva* in the ſame manner, with the ſame Force and very frequently, telling, that notwithſtanding all his burning Thirſt, to ſwallow it was impoſſible; nor could he, without a kind of Horrour, hear of any kind of Drink, otherwiſe he was pretty eaſy till five that Afternoon, when all the former Symptoms concurring (tho' not ſo violent as laſt) inſtantly demanded a freſh Blooding; on which becoming eaſier, he paſſed that Night freer of Pain and hard Breathing, tho' without Sleep.

Towards Morning he attempted often to ſwallow, and at laſt got down ſome Drink, tho' with the utmoſt Terror and Pain. He had an emollient Fomentation applied very warm to his Breaſt and Belly when at the worſt, and fancied himſelf much benefited by it; but as his Pulſe became fuller, and the natural Heat more equally diffuſed over his Extremities, he complained it made him ſweat and faint.

From this laſt Blooding his Pulſe was ſoft, full and ſlow, he had an equable Heat over his Body, and a breathing Sweat till next Morning at Nine, when his Extremities gradually cooled, his Pulſe turned feeble, his Breathing quick and laborious, and his Pain ſharp; he was again blooded, but

but before five Ounces were taken he fainted, all the Symptoms immediately disappeared, his Deglutition easy, &c.

Next Morning all his former Ailments returned, and he was put under the same Necessity to blood as ever; on it he was instantly relieved, and continued pretty easy till eleven that Night. when all his former Mischiefs recurred, he was blooded, but before three Ounces were taken fainted; the Symptoms however abated, but returned with double Force at five next Morning, when he bled freer and without Fainting.

All this while it was with much Pain he could take a little warm Emulsion, not exceeding a Spoonful at a time.

He had been from the Beginning always confined to one Posture on his Back, and the least Attempt to move himself never failed to waken his Pain, which frightned him from the Use of Clysters often recommended.

He passed that Day much sunk, weak and dispirited, often fainting, till two next Morning, when the old Ails returning commanded immediate Blooding, which he bore better than the two last times; after this his Pulse was softer, fuller, and slower by much than at any time before, and

his

his Pain eaſier. All that Day he drank pretty heartily his Emulſion and a little Chicken Broath, till Midnight that he turned very ill, and without fainting bore a plentiful Blooding, on which his Pain quite evaniſhed, and next Morning his Pulſe was very near to the natural, and he could now move himſelf without wakening his Pain.

He had a diſcutient ſtrengthning Fomentation applied, an emollient carminative Clyſter with the Digeſtive injected, which was retained, and an other more ſtimulating repeated, which operated very well.

He had a Retention of Urine from an Inability to expell it, but on the ſecond Injection and fomenting the *Perinæum* it went off.

He could now take down any thing without the leaſt Pain, his Pulſe was come to the natural Standard, only he was extremely weak.

At eleven that Night he had a violent Reaching to vomit, which laſted half an Hour; he ſlept well till five next Morning, when an exceſſive Vomiting recurred, every thing ſtomachick or anodyne was immediately returned; but after caſting up a deal of green Stuff, and on applying very warm Cloaths to the Pit of his Stomach the Vomiting was ſtaid.

He now began to loath his Milk and Water, Chicken Broath, *&c.* and had in place of them Sack-whey, a very little ſolid Food, Veal Gellies, *&c.* and by this analeptick Diet in a few Days recovered Health, Strength, his former Air, and ſucceſsfully performed a long Journey.

XXX. *Loſs of Appetite, and an Atrophy from the Stomach diſplaced, by Dr.* Robert Lowis, *Fellow of the College of Phyſicians at* Edinburgh.

A Gentleman about ſixty three Years of Age, of a groſs Habit, healthy Conſtitution, and regular Courſe of living, had from his Youth been ſubject to an *Epiplocele*; about the End of the Year 1722 his Appetite for Meat began to fail and his Body to waſte; during his Indiſpoſition he had not much Thirſt, and was generally coſtive till ſome Weeks before his Death that a Looſeneſs came, not exceſſive nor accompanied with Gripes, towards the End of which his Stools had a Mixture of ſome purulent Matter and a very noiſom Smell:

His

His Urine for moſt Part was reddiſh, in ſmall Quantity, and let fall a groſs red Ground; he never complained of any Pain but what was occaſioned by the Piles, which went off in a Week or two without Blooding. About two Months before his Death he was ſenſible of a Weight upon his Stomach, in which Time alſo he obſerved the *Hernia* to increaſe much, and was troubled with frequent Belchings: The three laſt Months of his Illneſs he had great Watchings; his Pulſe was full, ſtrong, ſlow and hard, and his Breathing eaſy and free till a few Days before his Death.

At the Beginning of his Indiſpoſition he uſed no other Medicine but ſome gently purging and ſtomachick Bitters, fearing that Vomits might increaſe the *Hernia*; but his Diſeaſe ſtill going on, about the Month of *July* he was prevailed on to take a Vomit of *Emetic Tartar*, and after that ſeveral others at due Diſtances and pretty ſtrong, which brought up with much Difficulty a Quantity of tough, heavy, thick *Phlegm*, by which he had ſome ſhort Relief; he uſed likewiſe bitter ſtomachick Infuſions with and without Purgatives, and alſo ſuch Medicines as were proper to mitigate the moſt preſſing or uneaſy Symptoms. He uſed moderate Exerciſe in the Country,

a regular Diet, and Asses Milk; but his Body still wasting, and his Strength gradually failing, he died the 25th *October* 1723: Upon the 27th his Body was opened.

The first Thing observable was, That upon cutting the Teguments of the lower Belly there appeared little Fat, and the fleshy Fibres of the Muscles were almost intirely consumed.

2. The *Abdomen* being fully laid open there appeared very little of the Cawl, and that reached scarce so far down as the Navel, except upon the left Side, where more than the half of it had fallen down to the *Scrotum*, and was attached to the lower Part of the left Testicle, the *Annulus* on that Side being dilated so as to admit likewise two or three Fingers.

3. By this falling down of the Cawl, the Stomach, which was very much inflated and extremely thin and smooth, had been pulled out of its natural Situation, so that the *Pylorus* tended obliquely downwards almost as far as the right Side of the Navel, and the Gullet entred the Stomach at an acute Angle.

4. The Liver was large, weighing about six Pound, and reached under the left *Hypochonder*, taking up Part of that Space the Stomach should naturally have possessed; upon

upon its Surface and through its whole Substance were white ſteatomatous Swellings, as alſo ſeveral Ulcers, eſpecially upon the concave Side.

5. The Gall-bladder contained a blackiſh Bile, and the *Ductus Cholidochus* was ſo large as to admit two Fingers where it entred the *Duodenum*.

6. The Pancreas was Schirrous, but the meſenterick Glands were no ways indurated; theſe and every thing elſe in the lower Belly appeared to be ſound.

7. In the *Thorax* the Lungs were of a blackiſh Colour, and at the firſt Diviſion of the *Bronchi* in the left Lobe of the Lungs, there was found a round hard Body about the Bigneſs of a Filberd, outwardly as black as Ink, but when the membranous Cover was removed, appeared brownish, and was of a ſtony brittle Subſtance, like to ſomething he had once ſpit up in the Time of his Sickneſs.

8. The Heart was extremely flaccid.

XXXI. *A Tympany, by* Alexr. Monro, *Professor of Anatomy in the University of* Edinburgh, *and* F. R. S.

THE keeping of the Register of Patients, their Diseases, &c. having fallen to my Share in the Management of the Infirmary or Hospital for sick Poor lately erected here, necessarily obliges me to peruse with Care the Journal of all the Cases treated in the Hospital, and recorded by the Physicians and Surgeons; among which there are several (notwithstanding the small Number of Sick which the Fund of the Infirmary is yet able to maintain) that would not be unworthy of a Place in your Collection of medical Observations: I affirm this with more Assurance than can generally be done in behalf of Hospital Cases, because the Journal does not simply contain the Name of the Patient and Disease, the Receipts of Medicines prescribed, and the Time of the Cure or Death; but the preceeding History of the Patient and Disease, with the particular Complaints and Sym-

Symptoms, are recorded at their Admiſſion; and every Day after, all the Changes happening to the Sick, with the evident Effects of the Medicines, are inſerted; at the ſame time the Phyſicians are not confined, in ordering the Diet of their Patients, to the common Fare of the Houſe, but are allowed by the Managers to cauſe give whatever Food or Drink they think moſt fit; and ſuch of the Managers who are Viſitors in their Turns take care that theſe Orders are executed.

Having Permiſſion from the Managers, I have made an Extract from the Journal of the following Caſe, only changing the Form of a Diary, and abridging what I imagine your Deſign does not require, but was neceſſary in ſuch a Record: If this Specimen of Hoſpital Practice is acceptable to you, your yearly Volume may always be ſupplied with ſome Caſes from the ſame Collection.

Margaret Dog, aged twenty two Years, was ſeized with a *Tertian Ague* in *January* 1729, and being then Servant in a publick Houſe had no Care taken of her, but was allowed to follow every idle Preſcription that was offered by any of her Acquaintances; among a great Variety of very uncommon Medicines, ſhe was perſwa-

ded to drink great Quantities of Brandy, and powder'd Pepper in warm Ale, which changed the intermitting Fever into a moſt violent continued one, in which ſhe was delirious ſeveral Days; and as this went off the Ague returned, but with two, three, four, and ſometimes five Paroxiſms in a Day, which ſhe often attempted to put away with all the vulgar Specificks brought her: The Diſeaſe however continued obſtinately till *Auguſt*, when ſome Doſes of the Bark were given her; after which ſhe was attacked with ſharp Pains in her Loins and Belly, beginning commonly about the right *Os ilium*, and riſing upwards to croſs over by the Stomach to the left Side, attended with Gripes, *Borborygmi*, and ſwelling of the whole Belly, and for ſome Weeks one of her Legs trembled, became hot and ſweated at the ſame Hour each Day, while nothing like Ague was felt through the reſt of her Body. The Pains continuing her Belly became ſtill more diſtended, and ſometimes was ſtretched in a very ſhort time to a great Bigneſs, and then gradually ſubſided without Evacuations of any kind, but always remained more ſwelled than ordinary. When Winter came ſhe mended, and was for ſome time almoſt free of her uneaſy Symptoms; but in the Beginning

ginning of the Spring her Pains and Swelling returned, and after ſuffering them ſeveral Weeks ſhe repreſented her Caſe to the Phyſician and Surgeon then in Attendance at the Infirmary, and was received as a Patient there on the 24th *March* 1730.

Her Symptoms at this time were, a more than ordinary conſtant Swelling of her Belly, but ſometimes increaſing ſo monſtrouſly, that the Skin ſeemed to be in great Hazard of being torn, and her Breathing was much ſtraitned; The Swelling gradually decreaſed without any Evacuation; The Returns and Degree of this Swelling were very uncertain, and when the Belly was moſt detumefied, one could feel ſeveral unequal protuberant Balls every where, but eſpecially at the Sides of the *Abdomen*: Her Stomach was good, ſhe had no Thirſt, and her Urine was in ſufficient Quantity in Proportion to her Drink. She was very coſtive; her *Menſes* had returned at irregular Periods for ſome preceeding Months. There was no œdematous Swellings in her Legs, nor Complaints of any Parts elſe.

At her firſt Admiſſion ſhe took ſeveral Doſes of Purgatives which operated ſufficiently, but brought little or no Wind along with the *Fæces*, and altered the State of her Belly very little. On Account of her being

being irregular in her *Menſtrua*, and a Suſpicion of *Pituita* in the *primæ viæ*, ſhe was next ordered ſome Doſes of *Calomel*, which produced very little Change; and during two Months thereafter ſhe was conſtantly taking large Doſes of the antihyſteric Medicines, either by themſelves or mixed with Purgatives: The antihyſteric Plaiſter was kept always applied to her whole Belly, and once or twice the *Semicupium* was uſed, but without any Appearance of the Diſeaſe being cured, or Certainty of the Remiſſions ſhe now and then had being owing to any particular Medicine; for tho' the Swelling did not increaſe for two or three, nay, nine Days following more than once, yet the Hardneſs and Tumors of her Belly did not intirely remove, her Coſtiveneſs always remained, ſhe had no Paſſage of Wind any way, and the Medicine that at one time ſeemed to relieve her, was of no Effect in the next Return. From the time of her Admiſſion ſhe had her *Menſes* only twice, *viz.* *May* 17th and *June* 21ſt.

During this Period there are ſome Facts remarked in the Journal, which ſeem worth obſerving. 1. Several Times upon the Swelling's falling, ſhe complained of a Headach, once upon the Detumefaction com-

complained of Pains thro' all her Body, once of a Giddineſs, twice had a *Nauſea* and vomiting, and in the laſt threw up green Bile; and once her Stomach ſwelled greatly, when the reſt of the *Abdomen* ſubſided. 2. During the flowing of the *Menſes* ſhe did not ſwell, but became very big upon their ſtopping. 3. Blooding and Emeticks which were made uſe of for ſome accidental urgent Symptoms, had no very ſenſible Effects in making the principal Diſeaſe either better or worſe. 4. She never had Paſſage of Wind any Way, except a little Belching ſome Days before the firſt monthly Evacuation.

Sometime before the laſt Eruption of the *Menſes*, the Purgatives were given more ſparingly, and the Doſes of the Antihyſtericks of the ſtrongeſt Kind, ſuch as *Aſafætid. Ol. C. C. &c.* mixed with Soap were enlarged and given more frequently, and accompanied with the hotter Antiſcorbuticks, as they are commonly called, *e. g. Rad. Raphan. ruſtic. recent. Zinziber, &c.* infuſed in ſtrong Ale with Steel. The Patient was ordered to uſe frequent and ſtrong Frictions to all the Trunk of her Body and Extremities, and to exerciſe moderately. Immediately before the *Menſtrua* began to flow, Clyſters of the ſame Kind

Kind of Medicines were injected. The Courſes were in ſufficient Quantity; but as ſoon as they ceaſed, her Belly increaſed in its Circumference four Inches and a half, but ſoon ſubſided; and then ſhe complained of Pains, which a gentle Sweat carried off. *Borborygmi* were for the firſt Time obſerved, on the ſame Day *June* 25. and having taken ſome *Tinctura ſacra* at Night, ſhe paſſed ſome Blood next Day by Stool. This again was the firſt Appearance made by the *Hæmorrhoids*, which ſhe had been formerly ſubject to.

The two following Days her Saponaceous, Antihyſteric and Antiſcorbutic Medicines being ſtill continued, ſhe had ſuch Exploſions of Wind, ανω και κατω, that none of the other Patients would remain in the ſame Room, nay ſcarce on the ſame Floor with her. Her Belly became leſs and ſofter than it had been from the firſt Attack of the Diſeaſe; her Medicines (with a Doſe of *Syrup. de Rhamno* at proper Intervals) ſtill were continued, only the Proportion of Steel was increaſed; her flatulent Diſcharge went ſucceſsfully on, and tho' for ſome Time the Swellings returned, ſhe was ſtrong enough to do the Work of another Servant of the Infirmary who had fallen ſick; and having continued a conſiderable Time in

that

that Station of Servant to the Hospital, she still used her Medicines, till there had been no Relapse for several Months, since which she has been in very good Health, notwithstanding her having gone from the Infirmary into Service, where she wrought hard, fed indifferently, and commonly walked bare-footed.

XXXII. Cholicks *for six Years, from a Concretion form'd on a Plum-stone lodged in the Guts; by Dr.* THOMAS SIMSON, *Professor of Medicine in the University of* St. Andrews.

A Girl about twelve Years of Age, who had been long troubled with Cholick Pains, was last Year under my Management. She complained of Pains fixed in one Part about two Inches below the short Ribs of the Left-side, somewhat nearer to the Back-bone than to the Navel, where I was informed they had kept for at least three Years; but for three Years further back (in which they were confident she was subject to Cholicks) they had not observed whether the Pains were fixed to one particular Part or not. As to the Occasion of

of theſe Pains, the Child's Relation told me, that ſometimes ſhe took them, when they could blame nothing, but that ſhe never miſſed them ſome Hours after eating Peaſe, Oranges, Strawberries, or any other Summer Fruits, and upon taking any Thing that was ſowr or hard of Digeſtion; all of which for the moſt Part produced a looſe Belly, which carried the Trouble off; but if this did not happen, they were obliged to procure ſome Stools by Purges or Clyſters, which always ſucceeded till this Attack of the Diſeaſe, when I was conſulted.

This Fit which was reckoned to have been occaſioned by drinking ſmall Ale upon the Turn, was accompanied with a violent Conſtipation; and the Pain was ſo violent, that ſhe cried out in a moſt moving Way, holding the affected Side as firm as ſhe could with her Hand. Her Stomach was ſo ſqueamiſh, that ſhe threw up every Thing immediately after ſwallowing it. Her Pulſe was in the mean Time of a natural Strength and Quickneſs, Clyſters had little Effect on her; and tho' ſhe got Purgatives in different Forms, and Clyſters were repeated ſome Hours after, to ſollicite them downwards, yet they never were ſucceſsful. Several other Remedies were uſed at the

the same Time, but all to no Purpose. The Pain and Vomiting seldom left her for three Weeks together; in which Time, from the Fatigue and Want of Sleep and Nourishment, she was brought from a plump well-coloured Girl, to have much the Countenance of a Skeleton.

After so many Disappointments in my Attempts to help her, and looking on her Case as desperate, I was resolved to give her no more Drugs; but early in a Morning observing her to vomit a great deal of Bile of a deep Tincture, I began to suspect that the abounding of such a sharp Liquor might be the Occasion of her Trouble, and with that View desired she might drink down an *English* Pint, or a Pint and a Half tepid Water, to provoke her to vomite, and to repeat this six or seven Times. She immediately fell about the Work; and, with some small Intervals went through her Task, which proved a Remedy to her, but in a different Manner from what I expected; for after she had vomited five or six Times with the Water, she had a Demand to Stool, which was copious; and in passing the *Fæces*, she was sensible of something bulkie and hard among them. Upon a Search the Ball herewith sent was found. (See *Tab.* IV. *Fig.* 3. and 4.)

This

This Ball is, you ſee, of an irregular cubical Shape, with a deep Depreſſion A (*Fig.* 3.) in two of its Sides that are oppoſite to each other; it was four Inches in Circumference, and weighed five Drachms at firſt, tho' now it is much lighter: It ſeems to be compounded of Threads matted together and diſpoſed into Layers. (See *Fig.* 4. *which repreſents the two Parts of it when it was cut through the Middle.*) In the Middle of it there is a Plum-ſtone B, the flat Sides of which anſwer to the Depreſſions in its external Surface. C ſhows the Cavity in which the Convexity B of the Plum-ſtone was lodged.

I imagine the Plum-ſtone had been ſix Years in my Patient's Body gathering the Cruſt round it, and had occaſioned the Cholicks ſo long: In the Perſwaſion of her Diſeaſe depending on this preternatural Ball, I made no Scruple, when asked by the Friends whether I thought ſhe would be any more troubled with theſe Cholicks, to give it as my Opinion that perhaps ſhe might have ſome ſmall Relapſes, till once the Parts ſo long diſtended and compreſſed by the Ball had recovered their natural State again, but that in a ſhort time ſhe would be quite free of them, ſince what I was confident was the Cauſe was now removed; which

which has fallen out accordingly, ſhe having had no Fits theſe eight Months except two; one ſhe took pretty ſeverely the tenth Day after paſſing the Ball, which was carried off by Bathing and Blooding; a ſecond ſhe was ſeized with half a Year after from Cold, which went off without Medicines: And all this while ſhe has ate every Thing that comes in her Way, particularly Peaſe and Oranges, which of all Things brought formerly the Fit moſt certainly upon her.

XXXIII. *An ESSAY on the* Jaundice, *by* ——.

WHERE Theories are only applied to the Reſolution of ſome ſpeculative Queſtion, it is of Uſe to expoſe the falſe Colouring; but where they are employed to explain the Nature of Diſeaſes, and either immediately or by very ſpecious Conſequences are introduced to influence the therapeutick Part of Phyſick, they ought to be throughly examined, that we may either have a valuable Truth confirmed, or the World may be put out of the Hazard

of being ſeduced by a dangerous Error: It is with a View of being ſerviceable this Way that I propoſe to examine the Cauſes of a very common Diſeaſe, the JAUNDICE, which is treated of by the Generality of ſyſtematick Authors in Phyſick, in a manner that is capable, in my Opinion, of being attended with bad Conſequences.

One of the moſt frequent Cauſes of a Jaundice is ſaid by ſome Authors of the greateſt Reputation to be an Obſtruction of the extreme capillary Veſſels of the Liver, and this Obſtruction may, according to them, depend on *Inflammation*, *Schirrus*, *Pituita*, *&c.* I ſuſpect, on the contrary, that no Obſtructions in the extreme Branches of the hepatick Blood-veſſels is capable of producing this Diſeaſe, unleſs in ſome particular Caſes where they may act as a remote Cauſe; of which I ſhall have Occaſion to make Mention afterwards.

I would found this negative Proof on the Nature of all the ſecreted Liquors, which never appear in the compound Maſs of our Fluids, but only begin to diſplay their different Properties after they are ſeparated from the other Juices by the ſecerning Organs; and even then, they do not ſeem to partake of the Qualities generally aſcribed to them and by which they

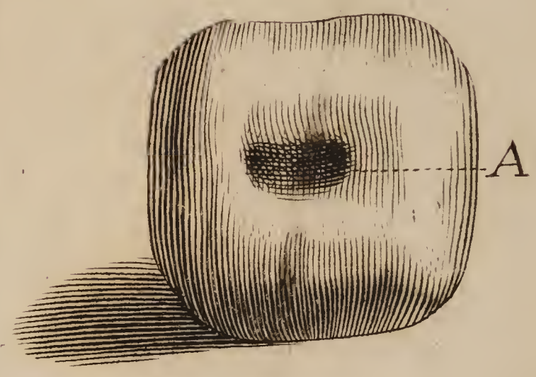
are

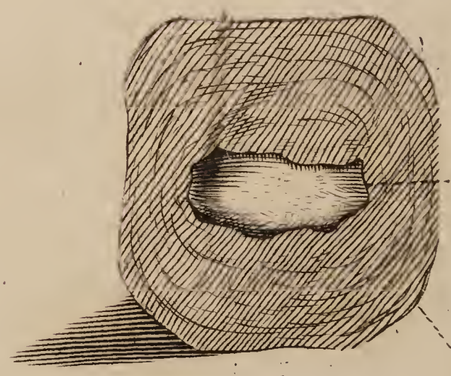
Tab: IV.

Fig. 1

2

3





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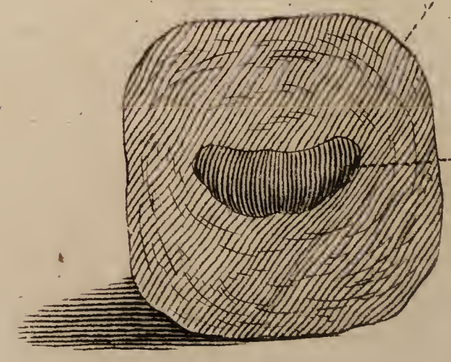

Ad vivum del. & sculp. R. Cooper.

are known, until they are farther prepared and are thrown into ſome large Canals where their Quantity gives us an Opportunity of examining them: If after they are thus ſecerned and prepared they are again mixed with the other Liquors, without undergoing ſome new Change in their Compoſition, they do indeed evidently ſhow themſelves by their Effects. Since then the Particles fit for the Compoſition of any of our Liquors cannot be ſaid to enjoy the Properties of ſuch Liquors, I cannot ſee why thoſe that enter into the Compoſition of Bile ſhould be ſuppoſed to produce the Effect of Bile without having been ever ſeparated. We ſee plainly on the Stoppage of the Secretions of other Liquors, whoſe Colour, Smell and Taſte are capable of making us diſtinguiſh them, that they do not ſeem to ſhow themſelves in their natural Form any where elſe; thus, for Inſtance, in a hydropick Perſon, whoſe Urine is ſuppreſſed by the Compreſſion or Obſtruction of the Veſſels of the Kidneys, and whoſe Belly and *Tunica celluloſa* are thence greatly diſtended, we do not find that the Waters extravaſated into theſe Cavities have the real Marks of Urine in them; nay, in the Diſcharges of the Skin and Kidneys which are ſo ſuccedaneous to

each other, we cannot obſerve Urine drilling through the Skin, nor any thing like Sweat in the Liquor diſcharged from the Bladder. From theſe and other ſuch Examples I would imagine an Obſtruction of the Blood-veſſels of the Liver, conſidered only as ſuch, to be incapable of mixing bilious Particles with the other Fluids that are to circulate through the whole Syſtem of Veſſels, and therefore incapable of producing a *Jaundice*.

But ſeeing reaſoning *à poſteriori* is much more convincing in ſuch Matters than any other, I would next obſerve, that if Particles fit for compoſing Bile were ſuppoſed capable of producing all the Effects of Bile, it would then neceſſarily follow, that whenever ſuch Particles were ſent in large Quantities from the *Vena Portarum* into the *Vena cava* a Jaundice would be formed, conſequently this always would happen when any conſiderable Obſtruction is made in the Liver. Daily Practice and Heaps of Obſervations handed down to us ſhow however that violent Inflammations and great Abſceſſes have been in the Liver, and that whole Bowel has been ſchirrous, without any Appearance of a Jaundice; the Examples are ſo numerous I need not quote Authors; ſee only *Bonetus*'s Collections.

ctions. The Concluſion therefore that neceſſarily follows from theſe Facts is in the negative to the allowing Obſtructions to be an immediate Cauſe of the Jaundice.

It may be alledged that hitherto I have too abſtractedly conſidered Obſtructions as a Stop put to the Paſſage of the Liquors through the extreme Veſſels, whereas I ought to have had Regard to the neceſſary Conſequences of ſuch an Obſtruction, which it may be thought would ſolve all the *Phænomena* upon my own Principles. Theſe Conſequences are the Diſtenſion of the obſtructed Canals and the Compreſſion they muſt make upon the adjacent Parts, among which there muſt be ſeveral that contain the Bile that has been ſecerned, which will therefore be forced back again into the Blood-veſſels to occaſion a Jaundice.

That I may give my Opinion diſtinctly on this Subject, it will be neceſſary to conſider the different Parts of the Liver where ſuch an Obſtruction may be ſeated.

If the Obſtruction is made in the concave Side of the Liver in Parts ſituated near to the large bilary Ducts, and if the Swelling is very great, I ſhall allow it may ſtop the Paſſage of the Bile into the Gut, and ſo may ſerve as a remote Cauſe of the Jaun-

dice. I am not however convinced that this Effect will follow from the Compreſſion of the hepatick Ducts, unleſs the cyſtic Bile is alſo prevented to flow into the *Duodenum*: My Grounds of doubting whether the hepatick Bile can occaſion this Diſeaſe are the following. Both by the Taſte of the Liver at ſome Diſtance from the Gall-bladder, and by Trials made of the hepatick Bile when collected, we plainly find it to be a very mild Liquor, with a very ſmall Proportion of the proper bilious Particles. Next we ſee moſt of the Drains of the Body capable of tranſmitting bilious Particles along with their other Fluids: Thus the Spittle of icteric People is bitter, and their Urine and ſometimes their Sweat tinges Linnen yellow. Laſtly, The Quantity of Bile conſtantly refunded to the Maſs of Blood along with the finer Parts of our Food is conſiderable, and probably ſome of it has not its Compoſition changed by the Force of Digeſtion, yet there is no Appearance of its Mixture in a natural State. From theſe Obſervations one would be apt to ſuſpect the bilious Lymph of the Liver to be capable of gradually mixing with the Blood, without manifeſting itſelf, eſpecially ſince it can ſo quickly be ſent out of the Body by the Excretories; nay, tho' this

ſhould

ſhould not happen, we can ſcarce ſuppoſe ſuch a high Colour, ſtrong Taſte, and violent Effects, ſo quickly produced by the hepatick Bile, as is daily ſeen on the firſt Diſcovery of the Jaundice. To theſe Arguments might be added the Deficiency of proper Obſervations or Experiments to prove the Jaundice produced without the cyſtick Bile.

When Obſtructions of any kind occaſion a Tumor, any conſiderable way within the Liver near the Branches of the *Porus bilarius*, it may in part ſtop the Courſe of the Bile in theſe Branches, from which it may be taken up by the Ramifications of the *Vena Cava*: But the Conſequences of ſuch Bile will be of ſo much leſs Effect towards creating a Jaundice than in the foregoing Suppoſition, as the Quantity of Bile hindred to flow to the common Duct is leſs; and in Confirmation of this not being an adequate Cauſe to produce this Diſeaſe, we have numerous Examples of Tumors of all ſorts obſerved in the Liver upon Diſſection of Bodies that had no icterick Sign.

In reſpect of both the Suppoſitions I have made, it is to be remarked, that a conſiderable Tumor muſt be formed, before the Sides of the bilary Canals incloſed in their ligamentous Sheath can be compreſſed ſuffi-

ciently to have the Effects which I have granted, and when the Tumor is large enough, it muſt firſt ſtraiten the Branches of the *Vena Portarum*, which are larger than the contiguous bilary Ducts, therefore before theſe ſuffer the Quantity of Bile ſecerned muſt be much diminiſhed; if the leſſening of this Liquor is in the ſame Proportion with the ſtraitning of the Veſſels the Bile will paſs; if the Ducts cannot tranſmit all of it, the Quantity interrupted will be but ſmall, and its Effects will be little.

The laſt Suppoſition neceſſary to make, is the Obſtruction of the Veſſels remote from the larger bilary Ducts, where the *Tubuli* being ſmall a leſs Diſtenſion of the obſtructed Canals will have greater Effect on them. From what has been already ſaid, it will ſeem at leaſt neceſſary to ſuppoſe the Obſtruction pretty univerſal through the Liver, in order to obtain ſuch a Conſequence as is commonly diſputed for: But then it is alſo obvious, that the obſtructed Veſſels are the very Canals that ought to ſupply the Liquor which is to be ſecerned; and therefore the Secretion will be prevented, which is alſo brought about by the Compreſſion which the tumefied Veſſels make on the ſmall Tubes from which the bilary

bilary Canals riſe, that is, on the ſecerning Organs themſelves. If then there is any Truth in what I argued for, of unſecerned Particles, which might prove proper enough Materials for compoſing Bile, not being capable of cauſing a Jaundice, tho' they continue mixed with our Maſs of Blood, it will follow, that neither on this third Suppoſition will a Jaundice be produced. Nor will it be amiſs to ſupport this Reaſoning by repeating the Mention of the many Examples recorded of the Liver being intirely ſchirrous or ſuppurated, without the Perſons ever having a Jaundice.

This View of Obſtructions in different Parts of the Liver give, I imagine, ſome Reaſon to think ſuch a Cauſe unfit to produce a Jaundice, whatever other bad Effects ſuch Obſtructions may have in diſturbing the animal Oeconomy.

Whatever Fate attends the Doctrine of Obſtructions of the Liver muſt affect the Practice of curing the Jaundice; and if this Diſeaſe is ſo far from having Obſtructions for a frequent Cauſe that they cannot occaſion it, then *deobſtruent*, *aperient*, *reſolvent*, *&c.* Medicines and their different Claſſes adapted to the particular Nature of the obſtructing Matter will appear to be rather contrived for removing or mitigating

ſome

some concomitant Symptoms, and palliating some Effects of the Jaundice, than designed to make a radical Cure of the Distemper.

By what has been above hinted, it will be readily conceived, that the only Cause I would argue for as capable to produce a Jaundice, is the stopping of the Bile in the *Ductus communis cholidochus*, or in the *cystick* Duct, and perhaps in the common *hepatick* Duct of some few Persons, whose hepatick Bile is much stronger than it commonly is found.

Such an Obstruction may depend on a great Variety of Causes, such as large Tumors, or Abscesses in the concave Part of the Liver, or in any other Parts in the Neighbourhood of the large Ducts; violent Inflammations, or other Tumors in the Coats of these Ducts; the growing together of their Sides; violent Spasms in the *Duodenum*, by Poysons, or in hysterick Disorders; very great Inflammations and Distensions of that Gut, which often have the Appearance of Colicks, and principally Stones or Concretions falling down from the Gall-bladder.

Practical Anatomists sufficiently show how frequently Concretions are to be found here; scarce any of those who have handed down what they observed in dissecting

ſecting humane Bodies, have omitted to give Hiſtories of this Kind; only remark what a great Variety are deſcribed by *Morgagni* (*a*); and in another Book, *Bonetus's Sepulchret. Anat.* we read a Collection of numerous Examples of this Diſeaſe, the Jaundice, proceeding from this Cauſe, Stones; and ſeveral of the greateſt Practiſers in Phyſick, have taken Notice of Stones paſſing commonly, when the Jaundice were going off. On theſe Accounts it is ſurpriſing ſo little Regard is had now a Days to theſe Concretions in the *Ætiology* and Cure of this Diſeaſe, as to find them mentioned only *en paſſant* as a poſſible Cauſe, without any Directions to endeavour their Expulſion in completing the Cure, which I can only attribute to their being paſſed unobſerved, becauſe of the troubleſome diſagreeable Office of ſearching for them.

Let us with all this conſider how exactly the falling down of a Stone from the Gall-bladder into the Duct, explains all the *Phænomena* that commonly happen in the Jaundice, which no other Cauſe will do, and we ſhall have Reaſon to look on Concretions as a much more frequent Cauſe of this Diſeaſe than is generally thought. If a ſmall Stone falls into the Duct, a conſiderable

(*a*) Epiſtol. Adverſar. Act. Phyſico-medic.

rable Share of the Bile may ſtill paſs; and tho' the Patient's Urine becomes higher coloured, the Skin remains untinged, the Gall-bladder gradually is filled with Bile, which gives a Senſe of Weight in the Right Hypochonder, the Secretion is diminiſhed in the Liver by the greater Reſiſtance now made to the Evacuation of the Bile, and the Quantity of Blood returned to the *Vena Cava* is greater, which makes a Fulneſs in all the Veſſels of the Body, giving the Senſe of Fulneſs and Laſſitude, with an Inclination to ſleep. When a large enough Quantity of Bile regurgitates the Jaundice appears, and according to the Change of Situation of the Stone, the Diſeaſe will have Remiſſions or Increaſe. If the Concretion is ſo large as to preſs on the Sides of the Duct, it occaſions Pains about the lower Part of the Stomach. If the Irritation it makes is great, the Pains become more acute and lancinating, and the Stomach ſympathiſing as in the *Calculus Renum*, the Patient vomites. If this Irritation continues, the Part where the Stone ſticks will be inflamed, and the neighbouring Parts ſoon alſo come to be affected. By the Inflammation and Pain a Fever may be raiſed. When the Stone obſtructs the Duct entirely, the Excrements cannot be tinged

yel-

yellow, nor will the Inteſtines do their Duty becauſe of the Defect of Bile, which being reaſſumed into the Maſs of Blood, tinges the Urine, Skin, Eyes, *&c.* When the Stone falls quickly into the Duct and totally obſtructs it, the Perſon becomes ſuddenly icterick. If the Stone is ſoon puſhed forewards into the Inteſtine, the Diſeaſe is as ſoon removed by the Paſſage of the Bile being again free. If more Stones ſucceed each other ſoon, the Diſeaſe will appear to have had Remiſſions. If there is any conſiderable Interval between their falling down, ſo many periodical Returns will be made of the Diſeaſe. A *Diarrhea* often cures this Diſeaſe, or rather a *Diarrhea* is the Conſequence of the Cure, for as ſoon as the Concretion falls into the Gut, the Bile that was damm'd up, follows in a great Stream, and occaſions the *Diarrhea*, at which Time the Stone or Stones will be found among the *Fæces*.

Concretions not only exactly thus account for the Appearances of the Jaundice, but by them only the Effects of ſeveral plain antecedent Cauſes can be underſtood. This Diſeaſe, for Example, has been brought on by violent Anger, Riding, Reaching to Vomit, Fits of an Ague, and ſeveral other Convulſions or Agitations of the Body, which

which we cannot imagine to be any other reaſonable Way produced, than by a Stone's being puſh'd down by theſe Shocks of the Body into the Duct, from the Gall-Bladder, where it lay floating before. Which leads me naturally to think Phyſicians frequently liable to be deceived, when they ſuppoſe Spaſms, Inflammations, Colicks, acrid *Ingeſta*, &c. bringing on a Jaundice, by the ſole Conſtriction of the bilary Duct, without the Help of any Concretion; for in theſe Caſes either the Cauſes could not be ſo permanent, *e. g.* the Spaſms would not continue ſo long as the Diſeaſe does; or theſe Cauſes ſeem not capable to bring on the Diſeaſe ſo ſoon after their own Appearance, ſuch is the Inflammation; and if the Diſeaſe was owing to ſeveral of the Cauſes mentioned, it would not go off ſo ſoon as frequently it does. It is much eaſier therefore to conceive how ſuch forcible Cauſes bring down a Concretion, which proves the immediate Cauſe of the Diſeaſe.

If then Stones are found moſt frequently to give Riſe to this Diſeaſe, without the Acceſſion of any of theſe other Cauſes, which I have accounted capable of producing a Jaundice; and if theſe other Cauſes are ſo well fitted for bringing down looſe Concretions, ſo often to be met with in the

the Gall-bladder, it will follow that the firſt Thing a Phyſician ought to conſider, when called to an icterick Patient, is, whether any other Cauſe manifeſtly ſhows its ſelf without any Indications of a Stone, and according to the particular Nature of that morbid Cauſe, he muſt preſcribe; but if either the Symptoms of a Stone's being ingaged in the bilary Paſſages are blended with the others, or if there is not evident Reaſon for not ſuſpecting Stones to have any Share in occaſioning the Diſeaſe, which ſeldom will happen, particular Regard is to be had to ſuch Concretions in the Indications of Cure.

I know it has been objected to the Notion of bilious Concretions ſo often producing a Jaundice, that in icterick Bodies no Stones have been found in the Ducts, tho' ſought after; and in other Bodies Stones have been ſeen fixt in the Ducts, without any preceeding Jaundice. To the former Objection it may be anſwered, That I have already allowed other Cauſes to be capable of giving Riſe to this Diſeaſe; and many Caſes can be ſuppoſed, where tho' Stones occaſion it, yet we cannot expect they ſhould be found. To name one Inſtance among many, if an exhauſted Patient ſhould dye by the *Diarrhea*, which ſo frequently

ly comes on when the Concretions drop into the Gut, it would be in vain to expect to find them. The other Objection will as little prove what is intended by it, unleſs ſeveral other particular Circumſtances are accurately obſerved; as for inſtance, if the Stone was lodged in the Duct long enough to occaſion the Diſeaſe, or if it has been only forced down by the Agonies of Death: If it is large enough, and ſo ſituated as to hinder the Courſe of the Bile, or if it ſtill might allow this Liquor to paſs: If the Liver is ſound, and fit to ſecern good Bile, or if it is otherwiſe diſeaſed, and has either performed little or no Secretion, or has ſeparated a Liquor different from Bile. For if theſe Circumſtances come out in the latter of the alternate Ways I have propoſed them; this Obſervation will have no Weight as an Objection.

But to return to the Method of Cure, I have already given Reaſons why I think Phyſicians are to act in far the greater Number of icterick Caſes, with a View to Stones that are to be expelled; and this will ſtill appear more neceſſary, upon reconſidering the other Cauſes, ſeveral of which do not admit of a Cure, or at moſt we can promiſe very little upon our Succeſs in treating them; ſuch are all large Tumors

mors, ſituated near the great bilary Ducts, Poyſons, &c. If theſe therefore are cut off, and if moſt of the other Cauſes do not diſtinguiſh themſelves ſufficiently from Concretions, it will not be thought improper to affirm, that Jaundice ought to be treated rather more than can be ſaid of any other Diſeaſe, with one general Indication of expelling Stones, and the Spaſms, Inflammations, Tumors, &c. are only to be looked on as ſo many concomitant Symptoms, to which Regard is indeed to be had in the Management of the Patient, while the main Indication is to be purſued; and Medicines are to be applied in very near the ſame Form and Intention as are uſed in Caſes of Stones lodged in the Ureters, which bear a very ſtrong Analogy to the Subject, which I have juſt now treated of.

XXXIV. *The Bladder become ſchirrous, from a ſingular Cauſe; by Doctor* EDWARD BARRY, *Phyſician at* Cork *in* Ireland.

MR. *Moſes Dean*, a Gentleman of a conſiderable Family and Fortune, naturally of a ſtrong Habit of Body, and of

a ſtrictly temperate Manner of Living, while a Child had often diſcharged Gravel and ſmall Stones with his Urine. The Symptomes attending ſuch a Diſorder increaſed as he grew older; and about the Age of Twenty four he was cut on the Gripe (as the leſſer Operation is commonly called) for the Stone, and a very large one was taken out of his Bladder. Soon after the Wound in the *Perinæum* was healed; he complained of a Pain in that Part; this was ſucceeded by a hard Tumor which gradually increaſed in a painful Manner, for the Space of twenty one Years, at which Time it was ſo large, that it was equal to the Size of a Turky Egg, and prevented him from riding or ſitting, but with great Uneaſineſs. One Day being in a Chariot, he received a ſudden Jolt, which gave him ſuch exquiſite Pain, that he ſent for a Surgeon, and told him that he was determined to have the Tumor cut out or opened immediately. The Surgeon, tho' ignorant of the Nature of the Tumor, applied a Cauſtick, and afterwards cutting on the *Eſchar*, a very hard Reſiſtance was perceived, which, by dilating the Part, he found to proceed from a large Stone about four Inches and a half in Length, and two and a half in Breadth, contained between the

the Bladder and *Perinæum*. The Stone had a ſmall riſing Proceſs, which was fixed in the Orifice of the Bladder. After the Stone was extracted, the Urine conſtantly flowed out of that Orifice, which always obliged him to keep a Veſſel or Spunge to receive it, till the Time of his Death, which was ſeventeen Years after this laſt Operation.

During that Time ſeveral ſmall Stones paſſed thro' that Orifice, which with, the Acrimony of the Urine perpetually running off, not only hindered him from ſitting or riding, but made his whole Life a conſtant Scene of Miſery.

A Year before he died, purulent Matter frequently ſubſided in his Urine; all the Symptoms continued to increaſe, attended with bloody Urine, a Pain in the Region of the Kidneys, Colicks and frequent Vomiting.

On diſſecting of his Body, at which ſeveral were preſent, his Kidneys were found very large, with an unequal rough Surface, owing to a great Quantity of Gravel collected in them. A large Stone which could not paſs the *Ureter* was lodged in the *Pelvis* of the right Kidney, which was greatly dilated. In the left Kidney a large Stone was found in a Bed of Corruption.

When the *Pelvis* was examined, I was at a Loſs to find the Bladder, nothing that bore the leaſt Reſemblance to it appearing, and in the Place of it, a hard ſolid Subſtance was diſcovered, which I concluded muſt have been the Bladder, by the Inſertion of the *Ureters* into it, which diſcharged the Urine into the *Fiſtula*.

This indurated ſchirrous Bladder had no Cavity, but what the ſmall Stream of Urine kept open, it weighed thirteen Ounces and a Quarter. Cutting thro' it, the Inſide was white, and it ſeemed to conſiſt of ſeveral diſtinct ſchirrous Glands.

From the Inſertion of the Ureters to the external Orifice, was one continued fiſtulous Cavity. The external Margin of the *Perinæum* was mortified, the inſide of the *Fiſtula* was ulcerated, and had large lateral Sinuſes, and that Part of the indurated Bladder thro' which the Urine paſſed, was cancerated.

It plainly appears that this uncommon Diſorder was owing to the external Orifice in the *Perinæum*, being healed after the Operation, before the internal Orifice in the Bladder was united, by which Means the ſandy Sediment in the Urine ſubſiding and puſhing thro' it, form'd a Stone beween that and the *Perinæum*, which for the

the Space of twenty one Years increaſed, and dilated the adjacent Parts, till they could not admit any further Diſtenſion, and then the ſmall riſing Proceſs filled the Orifice.

I never viſited this Gentleman till about two Years before he died, and by a cooling, opening, Anodyne Regimen, endeavoured to palliate the Symptoms. This was all the Relief his Caſe would then admit of, but when the laſt Stone was taken out, there were two different Methods by which this preternatural Alteration in the Bladder might I believe have been prevented.

The firſt was by uniting the Orifice in the Neck of the Bladder, by firſt reducing it to a green Wound; but as the Lips of it muſt have been very callous, this might have been attended with great Difficulty and Danger.

The next was, by injecting through the Orifice into the Bladder Morning and Evening about a Pound of any detergent Injection, which by that Means might have kept it pliable and free from Obſtructions, and given artificial Motion, which might have ſupplied the Defect of the natural one, and perhaps in ſome Caſes where the Habit of the Body is diſpoſed to form calculous

Concretions, it might be preferable to the former; for 'tis certain that a great Number of Stones did often pass through this Orifice, which were too large to be discharged by the *Urethra*, and which might otherwise have been more quickly fatal to him than this Disorder, in which he miserably languished so many Years.

XXXV. *A Retention of Seed in Coition*; *by* WILLIAM COCKBURN *M. D. and Fellow of the Royal Society.*

A *Noble Venetian*, aged Twenty two Years, was married to a very fine Lady, with whom he cohabited with a good deal of Vigour, but never could emit Seed in the Coition; whereas in his Dreams he could discharge very freely. This Misfortune very much afflicted him and his Family; and as no Remedy could be found at Home, the *Venetian* Ambassadors residing in the different Courts of *Europe*, were desired to consult some of the most eminent Physicians in the Parts where they resided, to account for the Causes, and to find out a Cure for this extraordinary Complaint of the

the Difference of the States when in Sleep, and when actually in Coition.

I was of Opinion it consisted altogether in the *Urethra*, being closely shut up by Vigour of the Erection in Coition, which form'd so great a Resistance, that the Powers which throw the Seed out of the *Vesiculæ Seminales* could not overcome it; whereas in Dreams the Pressure on the *Urethra* being much less, an Evacuation was made.

The Method of Cure was not less successful than obvious, from the foregoing Account; for gentle Evacuations, and a slender Diet brought about and fully compleated their Desires.

XXXVI. *A Palsy of the inferior Extremities, with Mortification*; *by Dr.* JOHN DRUMMOND *Senr. late President of the Royal College of Physicians in* Edinburgh.

A Girl of Ten Years of Age, having catched a great Cold in the Month of *October* 1705, complained next Day of a Pain and Weakness of one of her Legs, and the Day following lost the Use of both, when the Pain ceased. *Two* Weeks after

ſhe was brought to *Edinburgh*, and put under the Care of Dr. *Archibald Pitcairn*, Dr. *Andrew Melvill*, *my ſelf*, and Mr. *Alexander Monteith* Surgeon. We found ſhe had loſt all Senſation and Motion from the Loyns downwards to ſuch a Degree, that ſhe did not feel when pinched or pricked in theſe Parts, and voided her Excrements and Urine involuntarly.

On the 9th *November* the following Fomentation and Ointment were ordered to be applyed to her Limbs,

℞. *Fol. Roriſmarin. Salv. Abſinth. à M j. Flor. Chamæmel. Sambuci à pug.* ii. *Lign. Guajac. Unc.* ii. *M. coq. ex aq. calc. lib.* viii. *ad lib.* vi. *addendo tempore uſus Sp. V. Unc.* iv.

℞. *Ung. Opodeld. Unc.* i. *ſem. Ol. Ror. marin. chemic. Drach. ſem. Ol. Abſinth. chem. Drach.* ii.

November 12. Some little Puſtules and Bliſters began to appear upon one of her Legs, for which an Ointment of *Ung. alb.* made firm with *Ceruſſe* was ordered.

15*th*. She took this Purgative, ℞. *Syrup. Violar. Unc. ſem. Tinctur. Jallap. Drach. ſem.* but got not one Stool by it, tho' about Mid-day ſhe had *Syrup. de Rhamn. Unc. ſem.* given her,

16*th*. Preſcribed a Purgative in this Form,

℞. *Sy-*

℞. *Syrup. de Rhamn. Violar. à Unc. ſem. Tinctur. Jallap. Scrup.* ii. But this did not in the leaſt operate. At five a-Clock in the Evening this Clyſter was injected, ℞. *Decoct. commun. pro Clyſter. Unc.* viii. *Electuar. lenitiv. Unc. ſem. Vin. Emet. Drach.* v. But this ſhe alſo retained till about Nine, when a ſharp Suppoſitory was introduced.

The Bliſters on her Legs began then to be ſo big, that the Fomentation and Ointment could not be uſed. Theſe Bliſters being cut with a Pair of Sciſſars, the Skin below appeared black, but ſeparated eaſily afterwards, and healed with *Ung. alb.*

19*th*, The Purgative was renewed, with Addition of *Tinctur. Jallap. Scrup.* i. but did not operate till a Suppoſitory was given at Night.

23*d*, Her Thighs and Legs were ſweated plentifully in a Box, in which Spirit of Wine was burnt. This Sweating was continued for ſome Days, and then both her Legs appeared covered with Bliſters; at the Bottom of each of which, when cut, a black Spot was obſerved, which ſeparated by the Suppuration in the ſame Manner as the Eſcar of a Cauſtick. The ſordid Ulcers remaining after theſe gangrenous Cruſts caſting off, cured with the Application of com-

common Digeſtive and *Aq. calcis*, tho' frequently the Bones were diſcovered by them, and when they ſeemed to be near healed a new Gangrene diſcovered itſelf at ſome Side of them.

December 4th, It was reſolved to give her a few Grains of Calomel; and that Evening ſhe took *Gr.* iv. in Conſerve of Roſes.

5th, The Bolus was repeated, and in the Night ſhe purged a great deal of black fetid Excrement.

9th, Her Pulſe felt very weak and languid, the Purging ſtill continuing this Julep was preſcribed: ℞ *Aq. Meliſs. Ceras. nigr. a Unc.* ii. *Cinam. ſ. v. Drach.* vi. *Confect. Alkerm. Drach.* Sem. *Laudan. liquid. gutt.* xxv. *Syrup. Cariophyll. Unc.* i. *M ſumat cochleare ad libitum.* At Night ſhe took *Mercur. d. gr.* iii. *Diaſcord. q. ſ. ut fiat Bol.*

10th, A black Spot as large as half a Crown appeared upon the *Os ſacrum*; it was hard as if made by Burning, and turned the Edge of the Biſtorie with which it was ſcarified; when the Scarifications were made on every Side to the ſound Fleſh the Mortification was found to reach as deep as the Bone; it was dreſſed with *Tincture*

of

of Myrrh and *Aloes*, and common *Digeſtive* to the Sides.

11*th*, Notwithſtanding the former Dreſſing the black Mortification had ſpread half an Inch on each Side; after having ſcarified again all round the Edges it was dreſſed as formerly.

12*th*, The ſphacelated Parts began to ſeparate from the ſound, but another gangrenous Spot appeared on the left Hip, where the *Os femoris* is articulated with the *Oſſa innominata*; this being ſcarified and dreſſed as the other began to ſeparate in two or three Days.

15*th*, Another Spot of the ſame Nature, as broad as a Crown, was obſerved on the under Part of the left Hip, one Inch and a half diſtant from the *Podex*, and ſtretched towards the *Pudenda*: Another little Gangrene was remarked at the ſame time upon the right Haunch-bone.

All of them were ſcarified and treated after the ſame Manner. When the gangren'd Parts intirely ſeparated, the Bone was always diſcovered in each of them, tho' theſe were the thickeſt muſcular Parts of the Body.

All this Time the Patient purged incredible Quantities of black moſt violently fetid Fæces.

17*th*,

17*th*, She took this Bolus, ℞ *Limatur Mart. Gr.* v. *Aquil. alb. Gr.* iii. *Conserv. Ros. q. s. ut fiat Bol.* which was repeated on the 18*th* and 19*th* at Night.

The Ulcer which was made by the falling off of the first Gangrene, and by which the *Os sacrum* was discovered, began to appear clean and the Bone to be covered with Flesh, when on the 23*d* a new Mortification appeared on the lower Edge of the Ulcer, which when separated discovered a considerable Share of the *Os sacrum* and *Coccygis*. At Night and on the 24*th* the *Bolus* last prescribed was given her.

25*th*, A Vomit of *Turbeth mineral Gr.* iv. was given; it vomited her gently.

30*th* and 31*st* at Night the *Bolus* of *Aquil. alb.* and *Limatur Chalyb.* was renewed.

2*d January* 1706, The *Turbeth mineral* Vomit was repeated.

4*th*, The Cartilage which covers that Part of the *Os ischium* on which the Tendon of the internal *obturator* Muscle moves as on a Pulley separated and was brought away: So that by the Mortification on the lower Part of the left Hip the *Musculi obturatores*, *Pyriformis*, *Quadratus* and *Gemelli* were destroyed, and by

by the other on the Joint of the Thigh the *Glutæi* were alſo ruined.

After this the Patient's Pulſe was ſo weak, that we preſcribed nothing except a weak Decoction of *Sarſaparilla.* Several new Gangrenes appeared at the Edges of the old Ulcers, which ſeparating inlarged theſe Ulcers ſo conſiderably that a Man's whole Hand might have been thruſt into ſome of them.

10*th*, The *Os coccygis* came out.

4*th February*, The great *Trochanter* ſeparated from the Thigh-bone and dropp'd out; and the Ligaments about the Joint of the Thigh being putrefied, the Head of the Thigh-bone thruſt itſelf out at the Ulcer, and at every Dreſſing it required to be reduced. She began now to purge *Fæces* of the ordinary Colour and Smell, but her Pulſe ſtill becoming weaker and her Strength decaying ſhe died on the 21*ſt* of *February*.

During the whole Courſe of her Diſeaſe ſhe never complained of either Pain or Sickneſs, but diverted herſelf as other Children uſe to do, and kept a good Stomach, till about the Middle of *January* when ſhe was conſiderably weakned.

From the Beginning of *December* till near the Middle of *February* ſhe purged at leaſt

least 3 or 4 Pound of black very fetid Matter every Day.

All the Month of *February* her Legs, Thighs and Belly were oedematous and remarkably big.

XXXVII. *An Account of the most remarkable* Discoveries *and* Improvements *in Physick made or proposed since the Beginning of the Year* 1731.

MR. *William Houston* Surgeon has accurately described the Plant of which the *Contrayerva* is the Root: The Name he gives this Plant is *Dorstenia, Dentariæ radice, Sphondylii Folio*, of which there are two kinds, one *Placentâ ovali*, the other *Placentâ quadrangulari & undulata. Philos. Transact. Numb.* 421. § 2.

Mr. *de Jussieu*, Physician and Member of the Academy of Sciences at *Paris*, assures us from his Experience of the successful Effects in Dysenteries of a thick yellow Bark, which has an astringent gently bitter Taste, brought first into *Europe* from *America* in 1713, called there *Simarouba*, and resembling what is described by the Anci-

Ancients under the Name of *Macer*. Mr. *de Juſſieu* obſerved that this Medicine was more ſucceſsfully given in Decoction than in Subſtance. The Doſe he uſually gave was the third Part of a Chopin of Decoction which had two Drachms of the Bark in it. *Memoires de l'Acad. des Sciences*, 1729.

An Accident of two Women dying ſuddenly in *Dublin*, after drinking ſome of the common diſtilled *Laurel Water*, gave Riſe to ſeveral Experiments made upon Dogs with the diſtilled Water and with the Infuſion of the Leaves of this *Lauro-ceraſus*, communicated by Dr. *Madden* Phyſician at *Dublin* to the Royal Society in *England*, and afterwards repeated and confirmed by Dr. *Mortimer*, *R. S. S.* by which it appeared that both the Water and Infuſion brought on Convulſions, Palſy and Death, when taken by the Mouth or *Anus*. *Philoſ. Tranſact. Numb.* 418. § 7. and *Numb.* 420. § 3.

We are informed from *Leyden*, that Dr. *Gaubius*, who has ſucceeded Dr. *Boerhaave* in teaching Chemy, gave in the Beginning of 1731 a publick College on Milk; in which he ſhowed a great Variety of Experiments, and, among the reſt, prepared its eſſential Salt, by boiling Whey (*Serum lactis*)

ctis) to one half, then filtrating it, he continued the Boiling and filtrating till it became of the Consistence of a Syrup, when it was put into a Cellar to crystalize, and there the Salt formed into a Cake, which was of a saccharous Taste and resembled *Manna*.

Not. This Preparation is somewhat different from that which *Valentini* (*a*) alledges to be the famous *Saccharum lactis*, so much cried up by the first Preparer of it *Ludovicus Testi* (*b*), and recommended by others as an infallible Cure of the Gout.

The new Experiments related by Dr. *Stahl*, in his Book of chemical and physical Experiments, are too numerous for us to enter upon an Account of them, and most of them relate more to Physicks than Medicine.

Dr. *Christ. Jac. Trew* of *Norimberg* prefers the rectified Spirit of Grain for preserving anatomical Preparations in, to Spirit of Wine, or Compositions of *Alcohol*, *Succinum*, *Camphor*, *&c*. because these, he says, soon change into a brown Colour, whereas the Spirit from Malt preserves its limpid Appearance. When any Part is designed to be preserved wet, he recommends the

(*a*) Medicina nov. antiq. (*b*) In Epistol.

the waſhing of it with Water, till the Water is no more tinctured with any Blood; the Water is next to be waſhed away with Spirits, and then the Preparation is to be put among the Spirits in the Glaſs where it is to be kept; the Mouth of which is to be very cloſs covered with a Glaſs Head, over which a wet Bladder and Leaf-tin are tied, *Commerc. literar. Norimberg* 1731, *Semeſt.* 1. *Specim.* ix.

We learn by private Letters from *Leyden*, that the Veſſels of the cryſtalline Humour of the Eye, ſaid in our publick News Papers laſt Year to have been diſcovered by Dr. *Albinus* Profeſſor of Anatomy there, are all the Branches of an Artery, which being ſent off from the Artery that enters at the central Part of the *Retina*, paſſes through the vitreous Humour, and when it reaches the cryſtalline diſperſes its Branches along the Surface of that *Lens* like *Radii* till they are exceedingly minute, when they pierce into its Subſtance.

Dr. *Albrecht*, Profeſſor of Medicine at *Erford*, in his anatomical Obſervations of two Men he diſſected, is of Opinion that the Bladder of a ſtrong Man may be divided into ſix Coats, among which he thinks the muſcular ought not to be reckoned, becauſe it conſiſts of irregular ſeparated Bun-

dles of Fibres. He obſerved that the Part of a waxy Injection coloured with *Cinnabar*, which had made its Way among the cellular Membranes covering the Coats of a Vein, left the colouring Powder behind it. After injecting Wax into the left pulmonary Vein, he remarked a Vein filled with the Injection, which run up on the out-ſide of the *Pleura* to four or five Inches Diſtance from the *Vertebræ*, and gave off Branches to the neighbouring Parts. By accounting for the *Phænomena* of ſeveral Diſeaſes from this Fact, he ſeems to think a Communication between the pulmonary and thoracick Veſſels always to obtain. *Albrechti Obſerv. Anat*, § 5, 8, 11.

Jo. Henr. Schulze, Profeſſor of Medicine at *Altorf*, having obſerved Wax paſſing, as he thinks, through the Coats of Arteries and Veins when theſe Veſſels were injected, of which that coloured with red loſt its Colour, while the green kept it, endeavours thence to account for the Secretion of Fat and the Production of an *Oedema*. *Commerc. literar. Norimberg.* 1731, *Semeſt.* 1. *Specim.* v.

Mr. *Senac*'s new Deſcription of the Structure of the Diaphragm, and his Remarks on the Action of this Muſcle are ſo very particu-

particular and connected, that they will not bear ſuch an Abridgment as our Deſign will allow.

Of the ſame kind are Mr. *Hunauld*'s Obſervations on the Structure and Actions of ſome Muſcles of the Fingers, and Mr. *Winſlow*'s Account of Rotation, Pronation, Supination, and other circular Motions; wherefore we muſt refer all theſe three to the original Papers in the *Memoires de l'Acad. des Sciences*, 1729.

Mr. *Monro*, Profeſſor of Anatomy here, has made ſo many Additions to his *Oſteology*, and *Treatiſe of the Nerves*, which he has tack'd to the new Edition lately publiſhed, that we cannot enter into a Detail of them.

Mr. *Winſlow*, in his *Expoſition anatomique de la Structure du Corps humain*, has mended every where the common Deſcriptions, and has added innumerable Particulars that were not mentioned before him, which make any tolerable Account of ſuch Improvements ſo much longer than our Work can admit, that we can do no more than recommend this Author to all who wiſh to have a very particular and genuine Knowledge of the Structure of the humane Body. He is indeed very ſhort, and extremely reſerved in explaining the

Functions and Uſes of the Parts, except in his Treatiſe on the Muſcles, where he ſhows prodigious Varieties in the Actions of theſe Organs of Motion that never were ſo much as hinted before.

Dr. *Bryan Robinſon* of *Dublin*, in his *Treatiſe of the Animal Oeconomy*, has endeavoured to improve on Sir *Iſaac Newton*'s Opinions concerning ſeveral Parts of the animal Oeconomy, and ſupports his Reaſoning by a Number of Experiments and geometrical Calculs. He ſhows *firſt*, the Laws that obtain in the *Motion of Fluids through cylindrical Pipes*, which ſerve as an Introduction to his Account of the Motion of Blood in the Veſſels.

Next, He argues for "*Muſcular Motion* being performed by the Vibrations "of a very elaſtick *Æther* lodged in the "Nerves and Membranes inveſting the "minute Fibres of the Muſcles, excited "by the Power of the Will, Heat, "Wounds, the ſubtile and active Particles "of Bodies, and other Cauſes."

The *third* Subject he treats of is *Reſpiration*; in which he contends "The Life "of Animals is preſerved by acid Parts of "the Air mixing with the Blood in the "Lungs; which Parts diſſolve or attenuate the Blood and preſerve its Heat, and

"by

" by both theſe keep up the Motion of the " Heart."

In the following Section he argues for *Digeſtion* being owing to gentle Heat and Motion. " By this Heat and Motion the " Texture of the Nouriſhment is changed " in the Bodies of Animals :" And then, " The conſtituent ſolid Parts of Animals, " according to their ſeveral Natures, are " endued with peculiar attractive Powers " of certain Magnitudes, by which they " draw out of the Fluids moving through " them like Parts in certain Quantities, " and thereby preſerve their Forms and " juſt Magnitudes."

Secretions, according to our Author, are performed thus : " The Glands in the Bo- " dies of Animals, according to their ſeve- " ral Natures and Diſpoſitions, are endued " with peculiar attractive Powers by which " they ſuck in various Juices from the " Blood."

In the *laſt* Place, He ſhows the Proportion of the Diſcharges of humane Bodies, *viz.* of *Perſpiration*, *Urine*, *&c.*

Mr. *Winſlow*, Phyſician and Member of the Royal Academy of Sciences at *Paris*, has propoſed an Improvement on the ordinary Manner of reducing inguinal or crural *Herniæ*, namely, to cauſe the Patient to reſt

on his Knees and Elbows while the Surgeon is attempting to reduce the Bowels, *Le Dran Observations Chirurgiques, Tom.* 2. *Obs.* 1. and *Journal des Sçavans Mai*, 1732.

Mr. *Cheselden*, Surgeon at *London*, has made a considerable Improvement on the lateral Operation for the Stone. Instead of pressing his *Catheter* backwards, he causes it to be supported as close to the Conjunction of the *Ossa pubis* as possible; and after having made a large Incision into the Teguments, he presses the Gut backwards with the Fore-finger of the left Hand, and having felt the Furrow of the *Catheter* with this Finger, he introduces his Knife with the Edge directed forward and downwards upon the Finger into the Furrow, immediately above the superior Part of the *Prostrata*; and with the Knife in the same Situation he cuts a small Share of the Side of the Bladder, its *Sphincter*, the Side of the *Prostrata*, the Ligament thro' which the small Beginning of the *Urethra* passes, and the bulbous Part of the *Urethra*. After this Incision the *Gorgeret* is introduced upon the Fore-finger, which has been kept in the Wound all this Time. The *Forceps* is quickly introduced, and the Stone is as quickly extracted. *Douglas*'s *Appendix*

to

to the Hiſtory of the lateral Operation.

Mr. *Garengeot*, Surgeon at *Paris*, has much inlarged his Treatiſe of Chirurgical Operations, in the ſecond Edition lately publiſhed; the moſt conſiderable Improvements in the practical way that we remarked to be here added are the following.

Tom. I. *p.* 298. Old Age is an Advantage in performing the Operations for *Herniæ*, becauſe old Peoples Guts are not ſo liable to inflame or gangrene as thoſe of young Perſons.

Ibid. p. 408. He recommends Exerciſe to hydropic People immediately before they are to be tapped, that the groſſer Particles in the Water of their Belly may be mixed with the thinner, and ſo may run out with them. And if there is Reaſon to ſuſpect any ſuch groſs Parts remaining after the Operation, he adviſes the Injection of Barley-water, to dilute them and bring them away.

Tom. II. *p.* 354. He deſcribes a new way of performing the Operation of the *Fiſtula in Ano*; it is this, Having thruſt a Probe through the Gut a little higher than the Bottom of the *Sinus*; and having drawn out that End by the *Anus* with the Finger introduced into the Gut, he makes an Inciſion parallel to the Probe, at an Inch Di-

ſtance from it on each Side, and cuts out all between the Inciſions.

Ibid. p. 431. A new Method of tying an wounded intercoſtal Artery, the Invention of Mr. *Goulard* Surgeon at *Montpelier*, is deſcribed; the Inſtrument imployed is a ſemicircular or very curve Needle, that has a Groove along its convex Part, and two Holes at ſome Diſtance from each other near the Point, piercing from the convex to the concave Side; this Needle is fixed into a long ſtraight Handle, and a Thread is put through the two Holes in ſuch a manner, that its Nooſe is on the concave Side, and the two Ends are on the convex, in the Groove of which they are hid and brought down to the Handle. When the Needle is thus mounted, an Inciſion is made croſs three Ribs, that where the wounded Artery is being the middlemoſt, when theſe are diſcovered the Needle is thruſt through the intercoſtal Muſcles contiguous to the upper Edge of that middle Rib, and about an Inch farther back than where the open Orifice of the Artery is, and is puſhed within the internal Surface of the Ribs downwards, and made to pierce outwards again immediately below the under Edge of the Rib; as ſoon as the Nooſe of the Thread on the concave Side of the

Needle

Needle appears without the Muſcles, it is to be raiſed with a Pin, and the anterior End of the Thread is to be drawn out; then the Needle being drawn back again brings out the other End with it; therefore the Thread being now round the Rib is to be tied firmly on it, and the Artery will be compreſſed.

Tom. III. *p.* 187. In performing the *Trepan*, he thinks it better for the Surgeon to reſt his Chin in a Ring made with the Fingers of the Hand that holds the Handle of the Inſtrument, than to reſt his Fore-head on the Back of that Hand in the common Way.

Ibid. p. 369. He thinks it is inconvenient for Surgeons to preſs with the Palm of their Hand on the Back of the Amputation Knife in making the circular Inciſion round a Limb, but rather to make Uſe of Mr. *La Peironyer*'s Crotchet or Hook at the Point of the Knife, into which a Finger is put for directing the Knife; or, if that is wanting, to take hold of the Knife near its Point with the Thumb and Fingers of the left Hand.

Ibid. p. 423. He is of Opinion that ſoft Compreſſion is much more effectual to ſtop *Hæmorrhagies* than hard Subſtances.

Ibid. p. 391. He condemns the Uſe of

Vitriol

Vitriol Buttons, even when Stitches of Arteries give way, and would rather truſt to ſoft Compreſſion.

Ibid. p. 414. He adviſes the Amputation of the Fore-part of the Foot when there is Occaſion; in doing which the Knowledge of the Articulations there only can guide the Operator.

The *Chineſe* ſeem to have had the Method of inoculating the *Small Pox* long before it was introduced into this Weſtern Part of *Europe*: Their Method of Proceeding according to *Father d'Entrecolle*'s Account is this; They gather the Scabs that come off from a healthy Child that has had the Small Pox in a favourable Way, and keep them well ſhut up in a *China* Cup till there is Occaſion for them; then taking four ſmall ones or two large ones, and putting a Grain of Muſk between them, they roll them in a little Cotton, and thruſt this Tent into the Child's Noſe, where it remains till the Symptoms of Infection begin to appear. The Child on whom this Inoculation is to be made is to be more than a Year old. If the Puſtules appear on the firſt Day of the Fever, the Child almoſt certainly dies: If they come out on the ſecond, the Event is uncertain: If they do

not

not ſhow themſelves till the Third Day, the Patient probably will recover. *Lettres edifiantes & curieuſes ecrites des Miſſions etrangeres par quelques Miſſionaires de la Compagnie de Jeſu, Tom.* 20. Paris 1731.

Dr. *Stevens* in his *Eſſay on Aliments*, prefixed to his Tranſlation of *Dolæus* on the Gout, endeavours to prove the Gouty Humours to be rather of an alcaline than an acid Nature, both from the Nature of our Fluids, and from the Diſeaſe being moſt effectually mitigated, or cured by an acceſcent Diet.

An anonymous Author gives a long Account of a *Colick*, which generally prevails in *Amſterdam* during the Winter, and deſtroyed many of the Inhabitants in 1730. Its Appearance is very like to what was formerly called the *Colick of Poictou*, and is here minutely deſcribed. The principal diſtinguiſhing Marks of it being its Obſtinacy, and bringing on Convulſions, Palſies and other Diſorders that are commonly called nervous. The Author redargues all the different Opinions concerning the Nature of this Diſeaſe, and endeavours to prove it to depend on a Gouty Humour. *Bibliotheque raiſonèe de l' Europe, Tom.* 8. *Art.* 2.

Dr. *Lobb* in his *Treatiſe on the Small Pox*

Pox, ſeems to diſapprove entirely of Blood-letting in the Small Pox; for the only Caſe where he would allow of it, is in the Beginning of the Diſeaſe, in a Patient who has a ſanguine *Plethora*, which is again confined to ſo many Circumſtances, that ſcarce ever ſuch a Patient will be met with.

He thinks with Dr. *Boerhaave*, that the Diſeaſe may be prevented or cured without any Eruption, but differs from the learned Profeſſor's Opinion of this being done by the *antiphlogiſtick* Method, and rather thinks a Specifick may be found: He propoſes the *Æthiops Mineral* as a Medicine that probably would prove ſuch a Specifick, and relates ſome Examples of the Diſeaſe being in his Judgment prevented by timely Uſe of *Æthiops*; but before he wou'd recommend it to general Practice, he propoſes to have ſufficient Trials of its Effects made on Malefactors, and lays down all the Regimen neceſſary to be obſerved during the Trials.

If Dr. *Lobb* diſclaims Blood-letting in the Small Pox, Dr. *Loeber* Profeſſor of Medicine at *Jena*, in his *Sure Rules to a ſucceſsful Cure of the Small Pox*, recommends repeated and plentiful Bleeding, and the greateſt Care to follow out the *antiphlogiſtick* Method.

XXXVIII. *A List of* Medical Books *published since the Beginning of* 1731.

JOh. Jac. Mangeti *Bibliotheca Scriptorum Medicorum, Tom.* 1. *Pars* 1, 2. *Tom.* 2. *Pars* 1, 2. *Fol.* Genev. 1731.

M. Frid. Ottonis Menckenii *Lipsiensis de vita, moribus, scriptis meritisque* Hieronomi Fracastorii *Veronensis Commentatio*, 4*to*, Lipsiæ 1731.

Hermanni Boerhaave *Sermo Academicus de honore Medici, Servitute* 4*to*, Lugduni Batav. 1731.

An Essay concerning the Nature of Aliments, and the Choice of them, according to the different Constitutions of humane Bodies. In which the different Effects, Advantages and Disadvantages of Animal and Vegetable Diet, are explained by *John Arbuthnot* M. D. Fellow of the College of Physicians and Royal Society, 8*vo*, *London* 1731.

Practical Rules of Diet, in the various Constitutions and Diseases of humane Bodies, by the *same Author*, 8*vo*, *London* 1732.

Joan.

Joan. Philip Breynii M. D. *&c. Historia naturalis Cocci Radicum Tinctorii quod Polonicum vulgo audit*, 4to Gedani 1731.

Prælectiones Pharmaco-mathicæ & medico-practicæ; or, *Lectures on the Rationale of Medicines, by* Edward Strother *M. D.* in 2 Voll. 8vo, *London* 1731.

Cynosura Materiæ Medicæ Continuatio secunda ad Cynosuræ materiæ medicæ Hermannianæ intentionem conscripta, publicæ luci exposita à Joh. Boeclero *M. D. & apud Argentinenses Pr. P.* 4to, Argentorat. 1731.

Codex medicamentarius seu Pharmacopœia Parisiensis, ex Mandato Facultatis Medicinæ Parisiensis in lucem edita, M. Hyacintho Theodoro Baron *Decano*, 4to, Paris 1732.

Institutiones Chirurgicæ; or Principles of Surgery, comprehending and explaining the general Intentions of all the principal Branches of that Science; by *G. Smith* of *Kendal* Apothecary and Surgeon, 8*vo*, *London* 1732.

Helmontius Ecstaticus sive visa Medicaminum potestas ab Helmontio somniante, revisa à vigilante Jo. Henr. Cohausen *M. D.* 8*vo*, Amstelod. 1731.

Geo. Ernesti Stahlii *Experimenta, Observationes, Animadversiones* ccc. *numero Chymicæ & Physicæ, &c.* 8*vo*, Berolini, 1731. Her-

Hermanni Boerhaave *Elementa Chemiæ quæ aniverſario labore docuit in publicis privatiſque Scholis*, in 2 Voll. 4*to*, Lugdun. Batav. 1732.

Nouvelle Oſteologie ou Deſcription exacte des Os du Corps humain, accompagnée des Remarques Chirurgicales ſur le Traitement de leurs Maladies & enrichie de Figures en Tailledouce par Jean Palfyn, *Demonſtrateur en Chirurgie à Ghent*, 12*mo*, Paris 1731.

Oſteologie ou Traité des Os par Jean Baget *Maitre-Chirurgien, à* Paris, 12*mo*, 1731.

The Anatomy of the humane Bones; to which are added, An Anatomical Treatiſe of the Nerves ; An Account of the reciprocal Motions of the Heart; and a Deſcription of the humane Lacteal Sac and Duct, by *Alexander Monro* Profeſſor of Anatomy, *&c.* the ſecond Edition, corrected and enlarged, 8*vo*, *Edinburgh* 1732.

Jo. Wilh. Albrechti M. D. & Pr. *Obſervationes Anatomicæ circa duo Cadavera maſculina*, 4*to*, Erfurti 1732.

Embryologia Hiſtorico-medica, hoc eſt, infantis conſideratio Phyſico-medico-forenſis, qua ejuſdem Nutritio, Formatio, &c. *exhibentur à* D. Martino Schurigio *Phyſico Dreſdenſi*, 4*to*, Dreſdæ 1731.

Lau-

Laurentii Heisteri *Professoris publici Helmstadiensis*, &c. *Compendium Anatomicum. Editio quarta prioribus longe auctior atque emendatior in* 2 *Tom.* 8*vo*, Norimberg. & Altorf. 1732.

Exposition Anatomique de la Structure du Corps humain, par Jaques-Benigne Winslow *Docteur en Medicine*, &c. 4*to*; or in 5 Voll. 12*mo*, Paris, 1732.

Henr. Bassii *Observationes Anatomicæ & Chirurgo-medicæ, in quatuor Decades digestæ, variis observatis rarioribus exornatæ & solidis Medicæ Scientiæ principiis superstructæ, cum Fig.* 8*vo* Halæ 1731.

Dissertationes Physico-mathematicæ partim antea editæ in Actis Philosoph. Londin. jam auctiores & emendatiores, partim nunc primum impressæ, auctore Jacobo Juryn M. D. Londin. 1732.

A Treatise on the Animal Oeconomy, by *Bryan Robinson* M. D. 8*vo*, *Dublin* 1732.

An Appendix to the History of the lateral Operation for the Stone, containing Mr. *Cheselden*'s present Manner of performing it, by Dr. *James Douglas*, 4*to*, *London* 1731.

Observationes Chirurgicæ de Calculo Renum, Vesicæ, Urethræ, Lithotomia, Ve-

sicæ

ficæ Punctura, in quibus Lithotomiæ methodum quam celeberrimus Jo. Jac. Ravius *Anat. P. exercuit tutissimam & felicissimam omnium hucusque inventarum methodorum esse variis experimentis & rationibus probat*, Jacob. Denys, *Chirurgus Leydensis*, &c. 8*vo*, Lugd. Batav. 1732.

Parallele des differentes Manieres de tirer la pierre hors de la Vessie par Henry François le Dran, *Chirurgien à Paris*, &c. 12*mo à* Paris 1731.

Observations de Chirurgie auxquelles on a joint plusieures Reflections en faveur des Etudians par Hen. Franç. le Dran, à Paris 1731.

De gezuiverde Heelkonst, ter onderwyzinge van den Leerende en konst oefenenden Heelmeester door Joh. de Gorter M. D. P. 8*vo*, *tot* Leyden 1731.

Traité des Operations de Chirurgie, par René-Jacques Croissant de Garengeot, *Chirurgien à Paris*, &c. in 3 Tom. 12*mo*, 1731.

Lettre ecrite au Sieur René Jacques Croissant Garengeot, *Maitre és arts de Bourges, &c. au Sujet de la nouvelle Edition de son traitè des Operations de Chirurgie*, 12*mo*, *à* Paris 1731.

Dissertationes Medico-chirurgicæ juxta circulationis leges, Autore Hugone Gourraigne *M. D. & Pr.* 8*vo*, Montpelier 1731.

Conspectus Chirurgiæ & Medicinæ, methodo Stahliana conscripta, autore J. Junkero, M. P. P. Halæ 1731.

Institutiones Medicinæ Theoreticæ Physiologiam & Pathologiam complectentes, autore Antonio Deidier M. D. *Chimiæ Pr. Montpelienſi*, &c. 12*mo*, Paris 1731.

Elementorum Medicinæ Physico-mathematicorum, Tom. I. *autore* Jo. Fred. Schreiber *Regio-montano*, 8*vo*, Francofurti & Lipsiæ 1731.

Christ. Godofr. Stenzelii M. D. *in Academia Vitembergenſi Pr. Medicina Theoretico-practica aphorismis in usum auditorum suorum comprehensa*, 8*vo*, Francofurti & Lipsiæ 1732.

Medicinæ compendium in usum Exercitationis domesticæ digestum cui accedit 1. *Oratio de praxis Medicæ repurgatæ certitudine.* 2. *Oratio de Animi & Corporis consensione mirabili in secunda quam adversa valetudine, autore* Johanne de Gorter *M. D. & Prof.* 4*to*, Lugdun. Batav. 1731.

Hygieine sive tutrix corporis humani modum ostendens quo homines absque medicamentis ætatem suam in statu naturali sano ac vegeto in seram usque senectutem protrahere valeant, tam ex veterum ac Neotericorum auctoritate quam ex propria animadversione desumpta à Jo. Franc. Paulo

Paulo Ganser, *Phil. & M. D.* Lipsiæ 1731.

Roberti Welsted *tentamen de variis hominum naturis remediisque ad singulas accommodandis, ubi morbi earum sive simplicium, sive mixtarum affines uotantur, ex quibus nata symptomatum diversitas exploratur, ipsæque sanandi rationes deducuntur*, 8vo, Londin. 1731.

Febrium continuarum quæ anno 1729. *Uratislaviæ grassatæ sunt recensio, occasione catarrhi febrilis per Europam epidemici adornata à* Jo. Gothofr. Hahn. *Phil. & Med. D. accedit Dissertatio de aeris inspirati in pulmones effectu* 4to, Uratislaviæ & Lipsiæ 1731.

Archeus Febrium Faber & Medicus, sive exercitatio Medico-practica de usu & methodo rationali solida, certa & secura tam in Febribus intermittentibus quam periodicis continuis administrandi Febrifugorum omnium maximum corticem Peruvianum seu Chinam, autore Jo. Henr. Cohausen, *M. D.* 8vo, Amstelod. 1731.

A Vindication of a late Essay on the Transmutation of Blood, containing the true Manner of the Digestion of our Aliments, and the Ætiology, or an Account of the immediate Cause of putrid Fevers or Agues: As also Observations upon the noble specific *Cortex Peruvianus*. To

which is added by Way of Appendix, a Dissertation concerning the Manner of the Operation of chalybeat Waters, in Opposition to the received Opinion of their operating by their *Pondus*, *&c.* founded upon experimental Observations, and demonstrable Principles, by *Thomas Knight* M. D. 8*vo*, *London* 1731.

Observations in Physick, both rational and practical, with a Treatise of the Small Pox, by *Thomas Apperly* M.D. 8*vo*, *London* 1731.

A Treatise of the Small Pox in two Parts, by *Theophilus Lobb* M. D. 8*vo*, *London* 1732.

Remedio alle Catarrali molestie, ed in consequenza à qualsi voglia inflammazione, ed a qualunque altra Malattia derivante, &c. di Sebastiano Rotano, 4*to*, *in* Verona 1731.

A mechanical Dissertation on the *Lues Venerea*, proving the Certainty of curing that Disease without Salivation, by *J. S.* Surgeon 8*vo*, *London* 1732.

Dolæus upon the Cure of the Gout by Milk-Diet; to which is prefixed an Essay upon Dyet, by *William Stevens* M. D. F. R. S. 8*vo*, *London* 1732.

Aretei Cappadocis *Opera cum Commentariis integris* Petri Petit *Parisiensis*, *atque*

que clarissimi Joannis Wiggani *doctis & laboriosis notis, & celeberrimi* Mattairii *opusculis in eundem, tandemque eruditissimi* Dan. Wilh. Trilleri *observationibus & emendatis, editionem curavit* Hermannus Boerhaave *Fol.* Lugdun. Batav. 1731.

Philosophical Transactions, giving some Account of the present Undertakings, Studies and Labours of the Ingenious in many considerable Parts of *Europe*, for the Year 1731, and some Part of 1732, *4to*, *London*.

Histoire de l' Academie Royale des Sciences *Année* 1729, *avec les Memoires de Mathematique, & de Physique, pour la meme Année tirés des Registres de cette Academie*, *4to à* Paris 1731.

Miscellanea Physico-medico-mathematica Vratislavienſia *oder angenehme curieuse und nurliche Rachrichten*, &c. *Anni* 1727, *Trimest.* 1, 2, 3, 4. Errford 1731, *4to*.

Bononienſis *Scientiarum & artium Academiæ Commentariorum*, *Tomus prior*, *4to*, Bononiæ 1731.

Actorum medicorum Berolinenſium *in incrementum artis & scientiarum collectorum*, *Dec.* 3. Vol. 1. *8vo*, Berolin. 1731.

Commercium literarium *ad rei medicæ & scientiæ naturalis incrementum institutum, quo quicquid novissimè observatum, agitatum, scriptum vel peractum est succinc-*

ete dilucideque exponitur, Anni 1731. *Semestre* 1. 2. 4*to*, Norimberg, 1731.

——*Anni* 1732, *Semestre* 1. *ibid.* 1732.

Dissertationes medicæ quas ex auctoritate amplissimi Senatûs Academici Edinburgensis, *& nobilissimæ in eadem Academia Facultatis medicæ Decreto, pro gradu Doctoratus summisque in Medicina honoribus & privilegiis ritè ac legitimè consequendis, examini subjecerunt.*

Jacobus Mallison Anglus, *De Pleuritide.*

Georgius Grieve Scotus, *De Secretione Bilis.*

Joannes Sutton Anglus, *De Rachitide.*

Joannes Jamieson Scotus, *De Infantum Morbis ab Infantia ortis.*

Samuel Kay Anglus, *De Nephritide.*

Jacobus Dalrymple Scotus, *De Tympania.* 1731.

Joannes Armstrong Scotus, *De Tabe purulenta.*

Robertus Paterson Scotus, *De Scorbuto*, 1732.

XXXIX. *BOOKS promised, and proposed to be soon published.*

THomas *Short* M.D. has published Proposals, and is taking in Subscriptions for

for publiſhing *The natural, experimental and medicinal Hiſtory of the mineral Waters of* Yorkſhire, Derbyſhire *and* Lincolnſhire.

In the Preſs *Pharmacopeæ Leovardienſis, ſexta Editio, reviſa & emendata.*

Pharmacopeæ Edinburgenſis, Editio tertia, recognita & emendata, is now preparing for the Preſs by the *College of Phyſicians* here.

Mr. *Cheſelden* Surgeon to her Majeſty, and to St. *Thomas*'s Hoſpital, will, 'tis expected, publiſh his large *Oſteology* this enſuing Winter.

Jo. Chriſtoph. Bohlius M. D. of *Koningsberg* is ſaid to be about to publiſh Γαλαξια *Corporis animalis occaſione experimenti Gedani de ductu thoracico capti.*

A *Proſpectus* is publiſhed of a Work that is ready for the Preſs in *Suabia*, under this Title, *Summaria hiſtoriæ abortuum molarumque diverſarum exclusarum.*

The *Academia Naturæ Curioſorum* in *Germany* have advertiſed their Deſign of publiſhing ſoon the third Volume of their *Acta Phyſico-medica.*

Jo. Phil. Burggrave junior, Phyſician at *Francfort* on the *Maine*, has publiſhed a Specimen of a *Lexicon medicum univerſale*, which he propoſes to make complete

in ſix ſmall Volumes in Folio, the Price of each of which is to be half a Ducat.

The *Weſteins* and *Smith* Bookſellers in *Amſterdam* are alſo about to publiſh in 2 Volumes *4to*, a Book under the ſame Name of *Lexicon medicum univerſale*, compoſed by *Theodorus Tronchin* and *Ludovicus de Neufville*, M. D. D.

A private Society at *Norimberg* are preparing Materials for correcting and enlarging greatly *Mercklin*'s *Lindenius Renovatus*: They deſign not to hurry their Work, and by that means to make it the more correct and complete.

Edward Milward has diſperſed Propoſals for printing a beautiful Edition of *Alexander Trallianus*'s Works, to conſiſt of 200 Sheets Folio: The Subſcription Price two Guineas.

Francis Clifton M. D. propoſes to publiſh *Hippocrates*'s Works in three large Volumes *4to*, at two Guineas Subſcription.

Dr. *Freind*'s Works are now printing at *London* in one Volume Folio.

Dr. *Albinus* Profeſſor of Anatomy at *Leyden* is ſaid to deſign the Publication of a very exact Copy of *Euſtachius*'s Tables, with an accurate Explication of them. A good Number of the Plates are already finiſhed, and he has been preparing the Text theſe ſeveral Years.

Mr.

Mr. *Winſlow*, in the prefatory Advertiſement to his *Expoſition Anatomique*, propoſes to publiſh eighty original Copper-plates in *Folio*, repreſenting all the Parts of the humane Body, with *Latin* and *French* Explications.

Such a Work is much wanted, therefore we are perſwaded Royal Bounty or generous Subſcriptions will enable him to finiſh ſo uſeful an Undertaking that already is conſiderably advanced; otherwiſe the Publick is in Hazard of making an irreparable Loſs; becauſe he ſays very juſtly, "*He foreſees this Work will be too* "*great for a private Man*, Surpaſſera les Forces "d'un Particulier."

XL. *SOCIETIES lately formed for the Improvement of Phyſick.*

A *Chirurgical Academy* is lately inſtituted by publick Authority at *Paris*; the Members of which are not only to publiſh their own and Correſpondents Obſervations and Improvements, but are to give an Account of all that is publiſhed in Surgery, and to compoſe a complete Hiſtory of this Art by their Extracts from all the Authors ancient or modern who have wrote on this Subject. This Academy is alſo to propoſe a Queſtion in Surgery every Year, whoever gives the moſt ſatisfactory Anſwer is to be rewarded with a golden Medal of

200 *Livres* Value. The Queſtion propoſed this firſt Year is, *Why ſome Tumors are to be extirpated and others are only to be opened; what are the Circumſtances in both theſe ways of operating which make the Cautery preferable to Cutting; and what are the Reaſons of Preference.*

Another Society is alſo lately erected at *Paris* under the Protection of the Count of *Clermont*, and is named the *Academy of Arts*; by which it is propoſed that all Arts are to be conſiderably promoted, both by the Labours of the Members of the Academy, and by the Aſſiſtance and Encouragement given by them to others who propoſe any uſeful Diſcoveries and Improvements. Among the Arts about which this Academy is to be employed ſeveral Branches of Medicine are comprehended.

The King of *Sweden* has founded a Society at *Upſal*, much on the ſame Footing with the Academy of *Sciences* at *Paris*.

It is talked in *Germany*, that the Phyſicians at *Studtgard* deſign to publiſh their *Acta* in the ſame Form as the *Berlin Tranſactions* are.

The *Hungarian* Phyſicians are ſaid to have entred into the Reſolution of forming themſelves into a Society, and of publiſhing their Obſervations.

INDEX.

A

Aird (Mr. *James*) his Hiſtory of Spaſms in the *Oeſophagus*, 277.
Albinus (Dr.) his Diſcovery of the Veſſels of the cryſtalline Humour of the Eye, 337.
Albrecht (Dr.) his anatomical Obſervations, 337.
Alterative Medicine, a new one, 46. The Cures performed with it, 52.
Analyſis of *Moffat* Water, 82.
Anatomy, Mr. *Winſlow*'s Syſtem of it, 339.
Anatomical Preparations how beſt preſerved wet, 336.
Angelus Sala's *Sulphur antimonii*, 48.
Animals, the Method of preparing them before injecting their Veſſels, 105.
Animal Oeconomy, a Treatiſe on it, 340.
Articulation of the lower Jaw, Remarks on it, 124. How to reduce it when luxated, 149.
Atrophy from the Stomach diſplaced, 290.

B

BArometer, its Deſcription, 7.
Barry (Dr. *Edward*) his Hiſtory of an Ulcer of the Lungs piercing into the Liver, 273. Of the Bladder become ſchirrous, 321.
Bathing in *Moffat* Water uſeful in Diſeaſes, 67.
Bellini, Objections to his Theory of Reſpiration, 158.
Belt to be uſed in the *Paracentheſis*, its Deſcription, 218.
Bladder urinary become ſchirrous, 321. Its Coats, 337.
Boerhaave, Objections to his Theory of Reſpiration, 160.
Bones, their Strength to reſiſt tranſverſe Fractures demonſtrated, 113. A large one extracted out of the Gullet, 210.

Books medical, a List of them printed since the Beginning of 1731, 349. Promised, and proposed to be soon published, 358.
Borelli, Objections against his Theory of Respiration, 157.
Burials, Extract from the publick Register of them, 45.

C

Calder (Mr. *James*) his Observations of the preternatural Conformations of the Guts, 203.
Callus supplying the larger Share of the *Tibia*, 238.
Calomelas rubbed with *Sulphur antimonii*, a powerful alterative Medicine, 47.
Carlyle (Mr. *William*) his Account of the large Share of the *Tibia* supplied by a *Callus*, 241.
Cheselden (Mr.) his Improvement on the lateral Operation for the Stone, 342.
Chick, how nourished in *Ovo*, 202.
Chinese have long practised the Inoculation of the Small Pox, 346.
Chorda Tympani, its Description, 150.
Cockburn (Dr. *William*) his Observation of the Retention of Seed in Coition, 326.
Coition, Retention of Seed in it, 326.
Colick for six Years from a Plum-stone, 301. Mortal in *Amsterdam* from a gouty Humour, 347.
Crystalline Humour of the Eye, its Vessels, 337.
Cutaneous Eruptions cured by *Moffat* Water, 79.

D

Diaphragm, its alternate Motions in Respiration accounted for, 162. A new Description of it, 338.
Digastrick Muscles do not pull the lower Jaw down, 132. Serve for Deglutition, 137.
Diseases most frequent last Year in *Edinburgh*, 37. Distinctions into such Numbers unnecessary, 261. Their Symptoms and Patient's Circumstances to be greatly regarded, 267.
Discoveries and Improvements in Physick, 334.
Douglas (Dr. *James*) describes right the Insertion of the external Pterygoid Muscles, 127.
——— (Mr. *James*) his Account of Worms evacuated at an Ulcer of the Groin, 232.

Douglas (Mr. *John*) his Observation of Stones in the Kidney, and Remarks on Nephrotomy, 231.
Drummond (Dr. *John*) his Essay on the Improvement of Physick, 258. Observation of a Palsy, with Mortification in the lower Extremities, 327.

E

Edinburgh, the City, its Description, 1. Diseases most frequent in it last Year, 37.
Eustachianæ Tubæ, their Situation, 152.
Experiments on the medicinal *Moffat* Waters, 82.
Extract from the publick Register of Burials, 45.
Extremities inferior, their Palsy, with Mortification, 327.

F

Fingers, Remarks on their Muscles, 339.
Fœtus in utero, different Opinions concerning its Nourishment examined, 171. Nourished by both Mouth and Navel, 189. The Reason of its *Thorax* not being moved alternately, 170.
Freind (Dr.) An Essay inscribed to his Memory, 242. His Character, 243. Vindicated, 244.

G

Garengeot (Mr.) his Dispute with Dr. *Friend* examined, 242. His Improvements in Surgery, 343.
Gaubius (Dr.) his Method of preparing the *Saccharum lactis* 335.
Gibson (Mr. *Joseph*) his Essay on the Nutrition of the *Fœtus in utero*, 171.
Gouty Humour of an alcaline Nature, 347. Causes Cholicks of a particular kind, *ibid.*
Groin, an Ulcer of it, out of which Worms were evacuated, 222.
Gullet, a Bone extracted out of it, 210.
Guts, two Examples of their preternatural Conformation, 203. A Mortification of them in a Hernia cured, 227.

H

HErniæ, a Mortification of the Guts in one cured, 227. Mr. *Garengeot*'s Account of the crural examined, 250. Improvements in reducing them, 341.
Houſton (Mr. *William*) his Deſcription of the Plant from which the Contrayerva is got, 334.
Hunauld (Mr.) his Remarks on the Muſcles of the Fingers, 339.
Hydrophobia in an Inflammation of the Stomach, 283.
Hydrops Aſcites how formed, 244.

I

JAmieſon (Mr. *James*) his Hiſtory of a Mortification of the Guts in a Hernia cured, 227.
Jaundice, an Eſſay on them, 305. Not cauſed by Obſtructions, 306. Moſt frequently occaſioned by Stones, 314.
Jaw lower, Remarks on its Articulation, Motion and Luxation, 124. Pulled down by the Muſcles of the *Os hyoides*, *Larynx*, *&c.* 140. Its Luxation conſidered, with the Manner of reducing it, 147.
Improvements and Diſcoveries made in Phyſick, 334.
Inflammation of the Stomach, a Hiſtory of it, 283.
Injections, an Eſſay on the Manner of making ſubtile ones, 94. Paſs through the Coats of Veſſels, 338.
Innes (Dr. *John*) his Obſervation of an Inflammation of the Stomach, 283.
Inſtruments for making the Meteorological Obſervations, their Deſcriptions, 7.
Inteſtines, Examples of their preternatural Conformation, 203. A Mortification of them in a Hernia, 227.
Juſſieu (Mr. *de*) his Account of the Effects of the *Simarouba*, 334.

K

KEnnedy (Mr. *John*) his Obſervation of a Wound of the Neck, with uncommon Symptoms, 206.
Kidney, Stones in it, 231.
King's Evil, cured by *Moffat* Water, 79.

L

Lactis Saccharum, how prepared, 335.
Laing (Mr. *David*) takes out the larger Share of the *Tibia*, which is ſupplied by a *Callus*, 238.
Laurel Water, its poiſonous Effects, 335.
Leg, an anomalous Tumor of it unſucceſsfully treated, 234.
Ligament of the *Os hyoides* its Uſe, 142.
Liquors to be uſed in injecting the Veſſels of Animals, 98.
Liver, an Ulcer piercing from the Lungs into it, 273.
Lobb (Dr.) his particular Opinion concerning the Small Pox, 347.
Loeber (Dr.) recommends Blooding in the Small Pox, 348.
Lower Jaw, Remarks on its Articulation, *&c.* 124.
Lowis (Dr. *Robert*) his Account of the Symptoms attending the diſplacing of the Stomach, 290.
Lungs an Ulcer of them, piercing through the Diaphragm into the Liver, 273.
Luxation of the lower Jaw, its Phænomena accounted for, and how to be reduced, 147.

M

Martin (Dr. *George*) his Eſſay on the alternate Motions of the *Thorax* in Reſpiration, 156.
Medicine, an alterative Mercurial one, 46.
Medicine, an Eſſay on the Improvement of it, 258.
Meteorological Regiſter, 12.
Milligen (Mr. *George*) his Account of the Virtues and Uſe of *Moffat* Water, 62.
Milk, the Method of preparing the Sugar of it, 335.
Mineral Waters of *Moffat*, their Virtues and Uſe, 62.
Moffat Water, its Virtues and Uſe, 62. Its Chemical Analyſis, 82.
Monro (*Alexander*) his Eſſay on the Method of injecting the Veſſels of Animals, 94. Remarks on the Articulation, Motion, and Luxation of the lower Jaw, 124. Improvements in tapping, 214. The Hiſtory of a Tympany, 294. Treatiſe of the Bones and Nerves, 339.
Mortification of the Guts in a *Hernia* cured, 227.
Motions of the lower Jaw, 128.
Mouth opened, by raiſing the upper Jaw, as well as by depreſſing the lower, 139.

Muſcles of *Os hyoides* and *Larynx* pull down the lower Jaw, 140. Their other Functions, 145.
Muſcles, Remark in ſtitching them, 256.

N

NEck, a Wound of it, with uncommon Symptoms, 206. Nephrotomy, Remarks on it, 232.
Nouriſhment of a *Fœtus*, the different Opinions concerning it examined, 171, Conveyed both by the Mouth and Navel, 189.

O

OBſtructions, Arguments againſt their being the Cauſe of the Jaundice, 306.
Oeſophagus, a Bone extracted out of it, 210. A Tumor in it from a ſingular Cauſe, 274. Spaſms in it, 277.
Operation the lateral for the Stone, Improvements in it, 342.

P

PAlſy in the inferior Exrremities, with Mortification, 327.
Paracentheſis, Improvements in performing it, 214.
Paton, (Dr. *Peter's*) Account of an uncommon Tumor of the Breaſt, 213.
Pericardium of a conoid Figure, 249.
Periſtaltick Motion of the Guts, its Cauſe, 168.
Phrenick Nerves, their alternate Compreſſion, the Cauſe of the alternate Motions of the *Thorax* 162.
Phyſick, an Eſſay on the Improvement of it, 258. Diſcoveries and Improvements in it, 334.
Plants, how nouriſhed, 201.
Plummer (Dr. *Andrew*) his Account of an alterative mercurial Medicine, 46. Experiments on *Moffat* Water, 82.
Plum-ſtone, Colicks for ſix Years from one, 301.
Porterfield (Dr. *William*) his Demonſtration of the Strength of Bones, 112.
Pterygoid external Muſcles inſerted into the moveable Cartilage of the lower Jaw, 127.

579

R

RAin, Instrument for measuring its Depth, 11.
Register of the Meteorological Observations, 12. Publick of Burials, an Extract from it, 45.
Respiration, the alternate Motion of the *Thorax* and Lungs in it accounted for, 156,
Robinson (Dr.) his Treatise of the animal Oeconomy, 349.

S

Saccharum lactis, how prepared, 335.
Sala (*Angelus*) his Method of preparing Sulphur Antimonii, 48.
Schulze (Dr.) Observes Injection passing through the Coats of Vessels, 338.
Seed retained in Coition, 326.
Senac (Mr.) his new Description of the Diaphragm, 338.
Simarouba, an *American* Bark, its Effects, 334.
Simpson (Dr. *Thomas*) his Account of Colicks for six Years from a Plum-stone, 301.
Small Pox, the Inoculation of it known to the *Chinese*, 346. Blooding discharged in it, 347. To be prevented by a Specifick, 348. Blooding recommended in it, *ibid.*
Societies lately formed for the Improvement of Physick, 361.
Spasms in the Oesophagus, 277.
Splanchnology of Mr. *Garengeot*, Remarks to be made in reading it, 249.
Stahl Dr. his chemical and physical Experiments, 336.
Stedman (Mr. *John*) his Account of a large Bone extracted from the Gullet, 219.
Stevens (Dr.) thinks the Gouty Humour to be of an alcaline Nature, 347.
Stitches in Muscles, Remarks on making them, 256.
Stomach displaced, and attended with Loss of Appetite and Atrophy, 290.
Stones, an Observation of two found in the Kidney, 231. They are the most frequent Cause of Jaundice, 314.
Swammerdam, Objections to his Theory of Respiration, 157.
Sulphur Antimonii, how prepared by *Sala*, 48. Rubbed with *Calomelas*, becomes an alterative Medicine, 47.
Surgery, Improvements in several Operations of it, 343.

Syncope, the Cauſe of it after Tapping, 246.
Syringe for Injections deſcribed, 96.

T

TApping the Belly, Improvements in performing it, 214.
Thermometer, its Deſcription, 8.
Thorax, its alternate Motions in Reſpiration accounted for, 156.
Tibia, two Examples of a large Share being taken out, and ſupplied with a *Callus*, 238.
Trew, (Dr.) his Method of preſerving Anatomical Preparations, 336.
Tubæ Euſtachianæ, their Situation, 152.
Tumor, an uncommon one of the Breaſt, 213. An anomalous one of the Leg, 234. Of the *Oeſophagus*, from a ſingular Cauſe, 274.
Tympani Chordæ, its Deſcription, 150.
Tympany, a Hiſtory of one labouring under it, 294.

U

ULcer of the Lungs piercing into the Liver, 273.

V

VEin, a Branch of the pulmonary communicating with the Thoracick, 338.

W

WAter mineral of *Moffat* its Virtues and Uſes, 62.
Waugh (Dr. *Gilbert*) his Obſervation of a Tumor in the *Oeſophagus*, from a ſingular Cauſe, 274.
Wind, its Direction and Force obſerved, 10.
Winſlow (Dr.) his Account of circular Motions, 339. Syſtem of Anatomy, *ibid.* Improvements in reducing *Herniæ*, 341.
Worms evacuated at an Ulcer of the Groin, 222.
Wound of the Neck, with uncommon Symptoms, 206.

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PAge 9. Line 22. for *four* read $4\frac{1}{2}$. ibid. l. 26. for 4 *Inches* 5 *Tenths* read 5 *Inches*. These two Errors are only in some Copies. p. 20. l. 31. f. 2. 021. r. 2. 121. p. 58. l. 23. f. *Bubos* r. *Bubo's* p. 95. l. 19. f. *Subtle* r. *Subtile*. p. 114. l. 11. f. $B \dagger Cc$. r. $B \times Cc$. p. 122. l. 8. f. *Bo*. r. *BQ*. p. 243. and elsewhere, f. *Friend* r. *Freind*. p. 244. l. 3. f. *ma* r. *m'a*. p. 263. l. 11. f. *Diacribrosis* r. *Diabrosis*. p. 284. l. 9. f. *wakend* r. *awak'd*. ibid l. 29. f. *for* r. *from*. p. 312. l. 19. f. *aleady* r. *already*. p. 350. l. 10. *Hermaniana* r. *Hermaniane*.

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Place	Tab.	Fronting	Pag.
	I.		124
	II.		156
	III.		234
	IV.		306